University of California
Lawrence Berkeley National Laboratory

INTEGRATIVE GENOMICS BUILDING PROJECT

Response to Comments

Prepared By:
University of California
Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, California 94720

April 2015

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Contact: Jeff Philliber, Environmental Planner
jgphilliber@lbl.gov

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1.0 INTRODUCTION

1.1 ENVIRONMENTAL REVIEW

On February 23, 2015, Lawrence Berkeley National Laboratory (UC LBNL) circulated for public review an Environmental Analysis and Checklist for the Integrative Genomics Building (IGB) project. The Environmental Analysis and Checklist was circulated for a 30-day period ending on March 24, 2015.

As stated in UC LBNL's Notice of Availability (also issued on February 23, 2015), all comments received on the Environmental Analysis and Checklist during the comment period would be reviewed, considered, and documented by the University in its CEQA-related decision making. UC LBNL received eight comment letters on the Environmental Analysis and Checklist. Although responses to these comments are not required by CEQA, UC LBNL has prepared responses to every comment and provides them in this document.

The Environmental Analysis and Checklist and this response to comments document are presented to the University of California Board of Regents – along with CEQA Findings and other project information -- for use in its decision making process for the proposed IGB project.

1.2 ORGANIZATION OF THIS RESPONSE TO COMMENTS DOCUMENT

This document is organized into five sections. Following this introduction (**Section 1.0**), **Section 2.0, Comments on the Environmental Analysis and Checklist and Responses to Comments**, contains a list of persons who submitted written comments on the Environmental Analysis and Checklist; the submitted letters; and responses to those comments. Each comment letter is coded and each comment is labeled with a number in the page margin. Each comment letter is presented immediately before its corresponding responses. **Section 3.0, Errata,** presents typographic corrections to Environmental Analysis and Checklist text. These corrections do not represent significant new information (as defined by *State CEQA Guidelines Section 15088.5*) and the conclusions of the Environmental Analysis and Checklist regarding significant impacts, alternatives, and mitigation measures remain unchanged. **Section 4.0, References**, lists documents used in the preparation of the responses to comments. **Section 5.0, Report Preparation**, lists persons involved in the preparation of this Response to Comments document.

2.0 COMMENTS ON THE IGB ENVIRONMENTAL ANALYSIS AND CHECKLIST AND RESPONSES TO COMMENTS

2.1 INDEX TO COMMENTS

All agencies, organizations, and individuals who commented on the IGB Environmental Analysis and Checklist are listed in **Table 2.0-1, Index to Comments,** below.

Table 2.0-1
Index of Comments

Letter	Name	Date
Agencies		
EBMUD	East Bay Municipal Utility District, David J. Rehnstrom	March 16, 2015
Organizations		
CMTW(1)	Committee to Minimize Toxic Waste, Pam Sihvola	March 23, 2015
CMTW(2)	Committee to Minimize Toxic Waste, Pam Sihvola	March 30, 2015
Individuals		
Jones	Jim and Dana Jones	March 10, 2015
Metzger	Dean Metzger	March 10, 2015
Shively	John Shively	March 24, 2015
Stage	Elizabeth Stage	March 23, 2015
Swift	Diz Swift	March 9, 2015

These eight comment letters and the responses to the comments are provided on the following pages. All page numbers refer to the published IGB Environmental Analysis and Checklist.

EAST BAY
MUNICIPAL UTILITY DISTRICT

March 16, 2015

Jeff Philliber, Chief Environmental Planner
Lawrence Berkeley National Laboratory, Mail Stop 76-225
One Cyclotron Road
Berkeley, CA 94720

Dear Mr. Philliber:

Re: Notice of Availability of a Draft Environmental Analysis and Checklist – Integrative Genomics Building, Lawrence Berkeley National Laboratory

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Availability of a Draft Environmental Analysis and Checklist for the Integrative Genomics Building at the Lawrence Berkeley National Laboratory (LBNL). EBMUD has the following comments.

WATER SERVICE

The existing LBNL facilities are currently served by EBMUD's Shasta and Berkeley View Pressure Zones. If additional water service is needed, the project sponsor should contact EBMUD's New Business Office and request a water service estimate to determine costs and conditions for providing additional water service to the existing parcels. Engineering and installation of water services require substantial lead time, which should be provided for in the project sponsor's development schedule. 1

WATER CONSERVATION

The proposed project presents an opportunity to incorporate water conservation measures. The project sponsor should be aware that Section 31 of EBMUD's Water Service Regulations requires that water service shall not be furnished for new or expanded service unless all the applicable water-efficiency measures described in the regulation are installed at the project sponsor's expense. 2

WATER RECYCLING

EBMUD's Policy 9.05 requires that customers use non-potable water, including recycled water, for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant, fish and wildlife to offset demand on EBMUD's limited potable water supply. 3

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . TOLL FREE 1-866-40-EBMUD

EBMUD's earlier comments on the Water Supply Assessment for the LBNL 2006 Long Range Development Plan approved in January 2008 recommended considering a satellite treatment system to utilize LBNL's generated wastewater and potentially use the recycled water to meet non-potable needs. While there is no mention of any plans for an on-site satellite recycled water project in the environmental checklist, EBMUD recommends that LBNL maintain continued coordination and consultation with EBMUD as they plan and implement the multiple projects under the 2006 Long Range Development Plan to determine the feasibility of providing recycled water for cooling and other non-potable uses.

4

If you have any questions concerning this response, please contact Timothy R. McGowan, Associate Civil Engineer, Water Service Planning at (510) 287-1981.

Sincerely,

David J. Rehnstrom
Manager of Water Distribution Planning

DJR:TRM:dks
sb15_040

East Bay Municipal Utility District, David J. Rehnstrom, dated March 16, 2015

Response EBMUD-1

The comment concerning scheduling of any necessary system upgrades with the East Bay Municipal Utility District (EBMUD) is noted. UC Lawrence Berkeley National Laboratory (UC LBNL) has already contacted EBMUD regarding water service for the IGB project and continues to closely coordinate with the District on water planning for Berkeley Lab. The 2006 Long Range Development Plan Water Supply Assessment (WSA) and subsequent UC LBNL WSAs establish the entitlement framework for water supply for all development at Berkeley Lab. No improvements to water supply facilities are needed to provide water to the IGB project. UC LBNL would be responsible for any on-site system upgrades required to serve the project.

Response EBMUD-2

The proposed IGB Project would include all water conservation features noted in EBMUD's Section 31 Water Service Regulation.

Response EBMUD-3

No source of non-potable water is available at the planned site of the IGB, nor is there an economically feasible way to provide this source. As part of the development of the conceptual design for the IGB into full construction documents, sustainable features (including recycling water generated by the IGB) will be studied and incorporated into the project plan if they are cost effective and within the project budget.

Response EBMUD-4

UC LBNL will continue to coordinate and consult with EBMUD as future developments are planned and implemented.

CMTW(1)

Committee to Minimize Toxic Waste

Jeff Philliber, Chief Environmental Planner
Lawrence Berkeley National Laboratory
Mail Stop 76-225
One Cyclotron Road
Berkeley, California 94720

March 23, 2015

Subject: Comments on the Draft Environmental Analysis and Checklist for the Integrative Genomics Building (IGB) proposed to be located at the Lawrence Berkeley National Laboratory site in the Strawberry Creek Watershed

Dear Mr. Philliber,

As part of our official comments, to be responded to, I am first submitting a 3-page letter by Geologist and UC Berkeley Professor Emeritus Garniss H. Curtis (Department of Earth and Planetary Science), dated May 11, 2008 and addressed to the UC Office of the President, expressing concerns regarding any proposed development in the lower part of Strawberry Canyon and in the next Canyon to the north known as Blackberry Canyon.

The IGB project is proposed to be built exactly in that area, the location of the former Bevatron accelerator. Professor Curtis states: " Most of the buildings of the Lawrence Lab. are on the unstable ground filling the old caldera, particularly the Bevatron and associated buildings. As the Cretaceous beds immediately west of these buildings have been eroded away, there is nothing to keep these soft caldera-filled beds from sliding. The buildings on them will certainly move a few feet in a major earthquake, if not hundreds of feet." " No major buildings of any kind should be constructed in either of these canyons bordering this huge block of unstable rock." 1

Figure 1., following the letter by Professor Curtis, shows his rendering of the LBNL site, an area between the Hayward Fault and the Lawrence Hall of Science, " where volcanic rocks underlying most of the Lawrence Lab complex fill an old crater, a collapsed caldera. The old volcano that once rose above these rocks collapsed after the expulsion of a very large amount of rhyolite ash, now largely removed by erosion. The volcanic rocks broke up as the collapse occurred and many show crushing and deformation and are mixed with large amounts of ash and volcanic fragmental debris, this material should never have been built on as it is so clayrich and unconsolidated." 2

1/30

Statement of Garniss H. Curtis, Professor Emeritus
Department of Earth and Planetary Science, U.C. Berkeley

On Sun, May 11, 2008 at 2:10 PM, Garniss Curtis <gcurtis@berkeley.edu> wrote:

To: anne.shaw@ucop.edu
From: Garniss Curtis <gcurtis@berkeley.edu>
Subject: regarding certification of final environmental impact reports for the proposed computational research and theory facility and the Helios energy resource facility and project approvals. [*Please note that several typographical errors and misspellings have been corrected in the following text.*]

As the request for my geologic opinion on the advisability of constructing large buildings in the lower part of Strawberry Canyon and in the next canyon to the north known as Blackberry Canyon came to me on May 4th, I have to be brief and rely on my memory. I shall first say as strongly as I can "absolutely do not construct any buildings in those two canyons", then I shall go into the reason based on the work I did as consultant to Mr. Ben Lennart 25 to 35 years ago, who was contracted by the University to investigate a number of sites for possible constructions or for stopping landslides that were threatening buildings. 3

First, the geologic setting of the two areas: The active Hayward Fault goes across the mouths of both canyons. Further east, the Wildcat Canyon fault parallels the Hayward Fault behind the Botanical Gardens and northward joins the Hayward near the town of San Pablo. Southward the Wildcat Canyon fault can be easily traced to Sibley Park and beyond. A few small epicenters lie along this fault near its junction with the Hayward, but it does not seem to be active elsewhere to the south. However, in the past, the area between the two streams and the two faults (which includes the whole of the Lawrence Laboratory complex) lay four miles to the south next to Sibley Park. The volcanic rocks in both areas have potassium-argon dates of approximately 10 million years, and the rhyolite found in both of them is the same rhyolite. The volcanic rocks underlying most of the Lawrence Lab complex fill an old crater, a collapse caldera. The old volcano that once rose above these rocks collapsed after the expulsion of a very large amount of rhyolite ash, now largely removed by erosion. The volcanic rocks broke up as the collapse occurred and many show crushing and deformation and are mixed with large amounts of ash and volcanic fragmental debris. This material should never have been built on as it is so clay-rich and unconsolidated. The western rim of this caldera is easily traced from its arcuate shape which is cut off by the Wildcat Canyon Fault just south of the Botanical Gardens near the upper part of Strawberry Creek. It swings around very close to the old Cyclotron and continues north to join the Wildcat Canyon Fault in Wildcat Canyon not far from the Merry-go-Round in Tilden Park. The boundary rocks to the west are sandstones and shales thought to be of Cretaceous age, that is, they are older than 65 million years. Exposures of these 4

2/30

sandstones and shales are good below Building 50 down to Bowles Hall, and they dip westward at angles of 20 to 25 degrees, about which more later. The Hayward Fault passes very close to the rear of Bowles Hall after going through the Stadium where it has caused major deformation of the support pillars and offset of the two sides of the stadium since its construction in 1927.

Behind Hearst Mining Bldg and a few feet to the east, is the Lawson Adit which is a tunnel going eastward. Begun in the 1920' or earlier, it was completed in 1938 when it reached the Hayward Fault. Professor George Louderback told me (Personal comm.) that it was not ordinary fault gouge that he found in the Hayward Fault zone but a peculiar mixture of serpentine and metamorphic rocks that also appear on the surface and underlie Stern Hall and part of Foothill Student Housing. Founders Rock near the comer of Hearst and Gayley Road is in this melange. Also in the tunnel are several exposures of the offset of Strawberry Creek as determined from the contained rounded cobbles of Strawberry Canyon origin . Thus this indicates a displacemeent of more than 600 feet north along the Hayward Fault. 4

Still further north along the Hayward all the way to San Pablo huge amounts of the melange similar to that in the Lawson Adit have been squeezed out of the Hayward Fault and are gradually sliding down the slope below the fault. Much of this melange has reached the bottom of the hill back of El Cerrito. Along the Arlington many houses built on this melange are sliding and have caused a great number of legal problems. Within the fault itself no movement can be detected in these deposits, some of which are more than 100 feet thick. Thus we believe that movement and expulsion of this melange takes place during major earthquakes on the Hayward Fault.

A great deal of research has been done recently on the Hayward Fault by the USGS at Menlo Park which was reported in a talk on the last Thursday of this past April. They have established a return time of major quakes of 6.5-7 magnitude on the Hayward Fault of 130 years. The last major quake along the northern part of the Hayward Fault was 140 years ago, so we are over-due. They estimate that there is approximately a 65 percent chance a major quake will occur in the next 30 years. 5

Lennart was able to get survey notes from East Bay Municipal Utility District for the San Pablo Dam water tunnel to El Cerrito which crosses the Hayward Fault and shows that the right lateral horizontal movement of approximately one centimeter per year is matched by uplift of the east side of the fault of approximately one centimeter per year also. So, with the evidence of the horizontal displacement of the old Strawberry Creek of 600 feet horizontally along Galey Road, the Cretaceous sedimentary rocks east of the Hayward Fault there have also risen 600 feet. Building 50(?) sits on these Cretaceous strata which, as mentioned, dip westward 20-25 degrees. If an earthquake occurs when these beds are soaked with winter rains the chance of a major landslide 6

3/30

are great along the slippage planes of shale dipping westward. Minor slides have already occurred in these beds behind Bowles Hall. Indeed, the Foothill Student Housing was planned to be built there until I called attention to the landslide. A major landslide would probably destroy all the buildings on both sides of Galey Road from the Stadium to the buildings on both sides of Hearst Avenue and would probably reach Dow Library, destroying everything in its path to that point and possibly beyond. Buildings in the lower parts of both Strawberry and Blackberry Canyons would be buried if not destroyed.

6

Major landslides of the type I have described here are not rare along the Hayward Fault as was shown to us during our study of the Hayward fault at the base of the hill behind the Clark Kerr Campus. We discovered that most of that campus was underlain by a large landslide that had originated in Claremont Canyon, and was gradually moved northward along the Hayward Fault. Trenches and drill holes showed this landslide to be up to 30 feet thick. It extends westward to and possibly beyond Piedmont Ave. Further south is a huge landslide that underlies most of the campus of Mills College and extends westward another quarter mile Still further south are more large slides that have originated in canyons and steep slopes east of the Hayward Fault. As the hills rise and become unstable, earthquakes cause them to break loose and slide. Very few large slides have occurred on the eastern slopes of the Berkeley Hills, hence the relationship to earthquakes of major landslides close to the Hayward Fault along the western slopes of the Berkeley Hills. Normal erosion rounds off unstable areas on the eastern slope of the Berkeley Hills before they break loose and slide.

7

Most of the buildings of the Lawrence Lab. are on the unstable ground filling the old caldera, particularly the Bevatron and associated buildings. As the Cretaceous beds immediately west of these buildings have been eroded away there is nothing to keep these soft caldera-filled beds from sliding. The buildings on them will certainly move a few feet in a major earthquake if not hundreds of feet. Keep in mind the Loma Prieta quake of l989 of magnitude 6.9 which from a distance of over 60 miles destroyed a section of the Bay Bridge, a section of the overhead freeway in Oakland killing 63 people, and many houses on filled ground in the Marina of northern San Francisco some 70 miles from the quake!

8

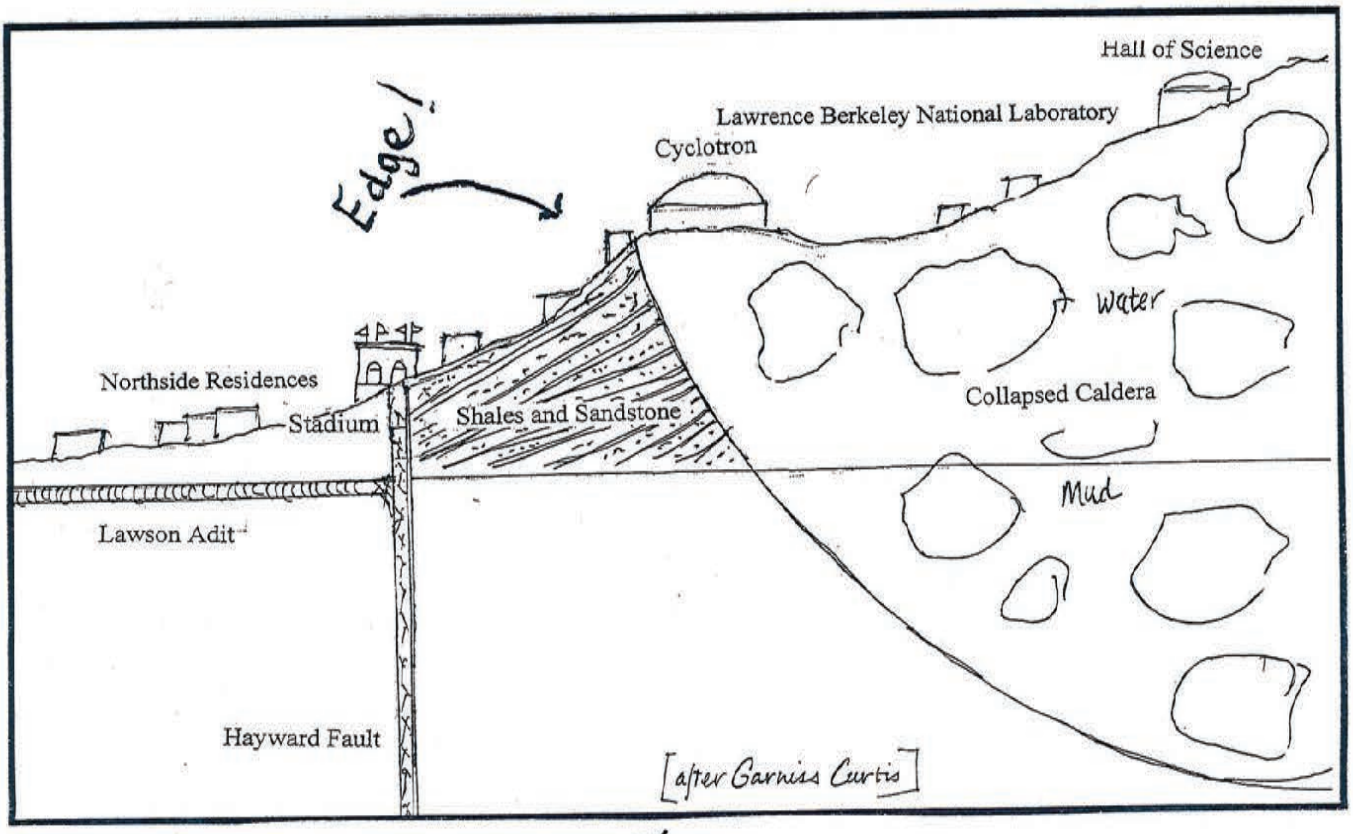
No major buildings of any kind should be constructed in either of these canyons bordering this huge block of unstable rock.

Profesor Emeritus Garniss H. Curtis
Dept. Earth and Planetary Science
University of California, Berkeley, CA

Garniss H. Curtis
Berkeley Geochronology Center
E-Mail: gcurtis@uclink.berkeley.edu

4/30

FIGURE 1.


Hall of Science
Lawrence Berkeley National Laboratory
Cyclotron
Edge!
water
Northside Residences
Stadium
Shales and Sandstone
Collapsed Caldera
Mud
Lawson Adit
Hayward Fault
[after Garniss Curtis]

5/30

Secondly, I am submitting CMTW's 15-page comment letter addressed to the Department of Toxic Substances Control (DTSC), dated June 5, 2013, expressing concern related to the inadequate clean-up of chemical and radioactive contamination left behind by the operations of the Bevatron Accelerator Complex, since it opened in 1954. We ask that all the questions and concerns expressed in the letter be fully responded to as part of our comments on the proposed IGB project to be built on this very same site.

Furthermore, in addition to the above, the Draft EA did not adequately analyze the geomorphological, hydrogeologic and other natural features of the Bevatron site. 9

It is critical to understand the impacts of the movement of water, both ground- and surface water in the Strawberry Creek Watershed. The exact location of the 2 most southern branches of the North Fork of Strawberry Creek were not described, one of which originates at the site of Building 58. This branch of the North Fork flows through the Bevatron building (B 51), and was the constant source of water in the Bevatron basement, which had to be continually pumped. (See Figure 2.) 10

No manmade culvert will prevent surfacewater finding the old, original creek bed and create problems as was the case with the Bevatron basement.

Include the history of water problems at the Bevatron site and the proposed mitigations. Also include the history of landslides in the area, and the proposed mitigations. Especially highlight the 1974 dry season landslide, which split Building 46 in half and destroyed infrastructure on the eastern side of the Bevatron Complex. Include a comprehensive description of the landslide event, which was caused by underground water of the Lennart Aquifer, currently pumped by the Shively Well, further up the Canyon. 11

Describe the current yields of the Shively Well and the reasons why the geologic water is dumped, rather than stored in tanks, as was the case originally, for fire fighting purposes. During the current extreme drought situation, it would be critical to conserve all the water pumped from the Aquifer. Why is it not done? How much is wasted annually? 12

In conclusion, we believe the Bevatron site was never adequately cleaned up, and when the next El Niño generated rain event will occur, with rising contaminated groundwater levels, human health and environmental problems will continue. This site should remain as open space, with the original branches of the North Fork of Strawberry Creek daylighted into perpetuity. The operations of the proposed IGB facilities should remain in Walnut Creek etc. where they would be much safer! 13

Pamela Sihvola
CMTW
P.O. Box 9646
Berkeley, CA 94709

6/30

FIGURE 2.


NORTH FORK OF STRAWBERRY CANYON
1974 AND 2012 LANDSLIDE AREA
50
70
76
LBNL B51 / BEVATRON
(PROPOSED) SITE FOR IGB PROJECT
7/30

CMTW(1)

URGENT

JUNE 5, 2013

JACINTO SOTO
DTSC PROJECT MANAGER
700 HEINZ AVE.
BERKELEY, CA 94710

SUBJECT: COMMENTS ON THE DRAFT INTERIM CORRECTIVE MEASURES (ICM) WORK PLAN AND PROPOSED NEGATIVE DECLARATION TO CONTROL THE MIGRATION OF CONTAMINATED GROUND WATER AT THE BEVATRON COMPLEX/ BUILDING 51 SITE OF THE LAWRENCE BERKELEY NATIONAL LABORATORY (LBNL).

THE MIGRATION OF CONTAMINATED GROUND WATER AT LBNL IS ALREADY AN IMMINENT THREAT TO THE ENVIRONMENT AS WELL AS A RISK TO HUMAN HEALTH!

A NEGATIVE DECLARATION UNDER CEQA IS NOT SUFFICIENT AND WE ASK THAT A MORE THOROUGH REVIEW, AN EIR, BE PREPARED TO ADDRESS THE PROBLEM OF MIGRATING CONTAMINATED GROUND WATER WITHIN THE ENTIRE WESTERN/ CENTRAL PORTION OF THE LBNL SITE.

SINCE THE BEVATRON COMPLEX WAS INVOLVED IN HIGH ENERGY PHYSICS RESEARCH FOR SOME 4 DECADES, WE ALSO ASK THAT DOE PREPARE

14

15

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AN EA OR EIS UNDER NEPA TO ADDRESS ANY RADIOACTIVE COMPONENTS ASSOCIATED WITH THE MIGRATION OF CONTAMINATED GROUNDWATER, SOIL, SOIL VAPOR, SEDIMENT ETC.

16

— PAST AND CURRENT HYDROGEOLOGICAL INVESTIGATIONS AT LBNL CLEARLY HAVE NOT BEEN SUFFICIENT TO ADDRESS ALL THE COMPLEXITIES OF THE SITE, BUILT ON TOP OF A COLLAPSED CRATER, CALDERA OF AN ANCIENT VOLCANO (SEE ATTACHMENT 1. SIBLEY VOLCANIC REGIONAL PRESERVE, ITEM #11: "HOW MANY VOLCANOES"?) — IN A MAJOR WATERSHED, THE STRAWBERRY CREEK WATERSHED, (SEE ATTACHMENT 2. HISTORIC HYDROLOGY, ADAPTED FROM FRANK SOULE'S 1875 MAP) — FILLED WITH NETWORKS OF CAND- SLIDES (SEE ATTACHMENT 3.) AS WELL AS DOZENS OF EARTHQUAKE FAULTS CUSS-CROSSING THE AREA (SEE ATTACHMENT 4.) CONSTANTLY CREATING HAVOC. MOST RECENT LANDSLIDE STARTED IN DECEMBER OF 2012, IN THE VICINITY OF THE BEVATRON, FORCING THE EVACUATION OF BUILDING 46, AGAIN! — STOP GAP MEASURES, SUCH AS WHAT IS PROPOSED, WILL NOT SUFFICE.

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9/30

CMTW(1)

ATTACHMENT 1.

tion, what geologists call "autobrecciation" (self-broken).

9 Here you see hard lava to the right and left, and soft, easily eroded tuff between, all tilted eastward almost to vertical. The lava to the left baked the top of the tuffs brick red. This lava has been mostly quarried away, but looks as if it was probably 100-150 feet thick. These flows were not fluid, but contained enough silica to be more viscous. They probably moved at a slow walk, with glowing blocks of lava tumbling down a steep front and setting vegetation on fire.

10 The brick-red knobs in the foreground, and rugged outcrops of the same color on the skyline, are made of cinder that flew from Round Top and landed while still hot, so the pieces welded together.

11 The major valley to the north across Highway 24 is Siesta Valley. It coincides with the axis of the Siesta Syncline, a great fold that has lifted up thousands of feet of rocks on both sides. You are standing on the southwest limb of the fold, which includes all the rocks in Sibley.

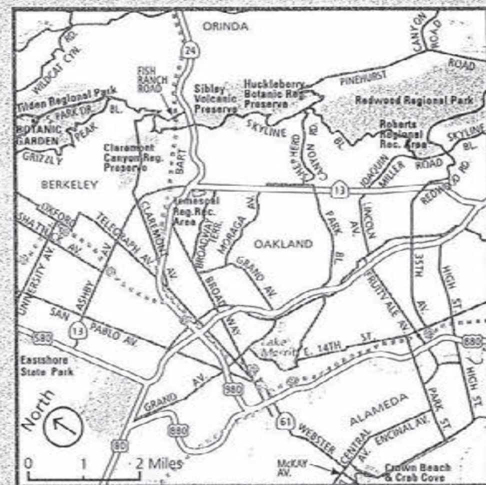
HOW MANY VOLCANOES? Round Top is the obvious one. There are smaller ones outside the Preserve to the north and southeast. Another, of rhyodacitic composition (rather like the ash from Mount St. Helens), underlies the Lawrence Berkeley Laboratory and Little Grizzly Peak in Tilden Regional Park. About 9.8 million years ago it was erupting beside Round Top. Subsequently it was shifted about three and one-half miles northwest by movement along Wildcat Fault. That makes a total of four volcanoes.

THIS PRESERVE is named to honor Robert Sibley, a founder and director of the East Bay Regional Park District, and president of the Board of Directors from 1948 until his death in 1958. The original 227-acre Preserve was dedicated with Tilden Regional Park and Temescal Regional Recreation Area in October 1936, two years after the Park District's formation. A quarry site north of Round Top was added in 1977, and another quarry site farther to the northwest was added in 1991. Together, these acquisitions brought the Preserve close to its current 660 acres. With the addition of these quarry sites, the Park District inherited a cross-sectional look at relics of the volcanic activity that occurred in the Berkeley Hills.

At the southern park boundary is 235-acre Huckleberry Botanic Regional Preserve. The Skyline National Recreation Trail, which connects Richmond-El Sobrante to Castro Valley, traverses both of these parks.

*

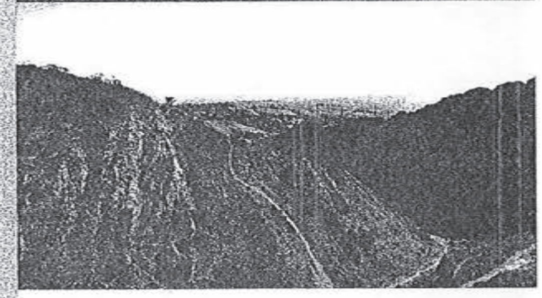
P. 3/15 10/30



Sibley Volca...

Regional Pres...

East Bay
Regional Park District



East Bay Regional Park District
2950 Peralta Oaks Court,
P.O. Box 5381
Oakland, CA 94605-0381
1-888-EBPARKS www.ebparks.org

Rev. 4/10

ATTACHMENT 2.

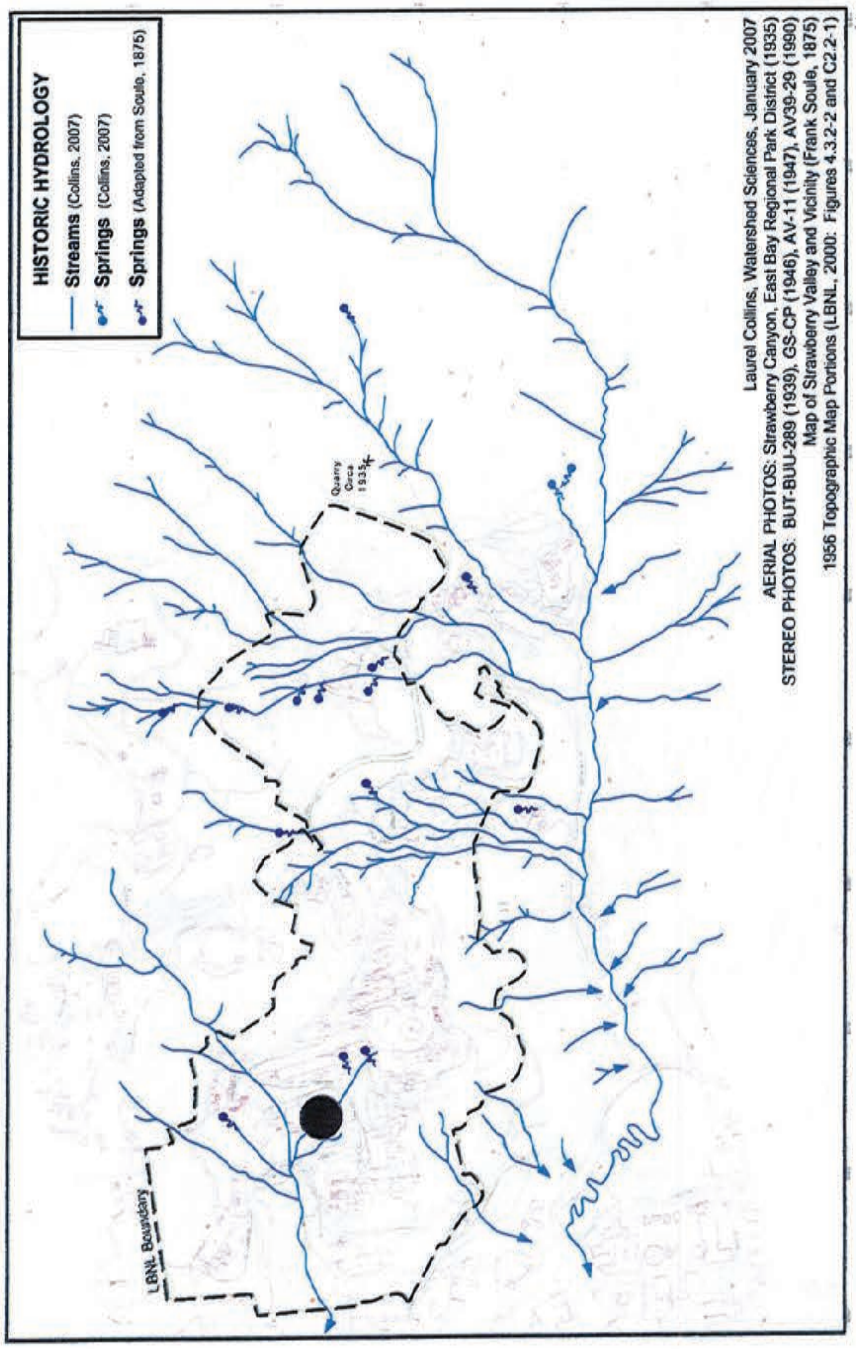


FIGURE 5. INTERPRETATION OF HISTORIC CHANNEL NETWORK AT LBNL IN STRAWBERRY CREEK WATERSHED

BEVATRON COMPLEX

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WATERSHED SCIENCES, MARCH 2007

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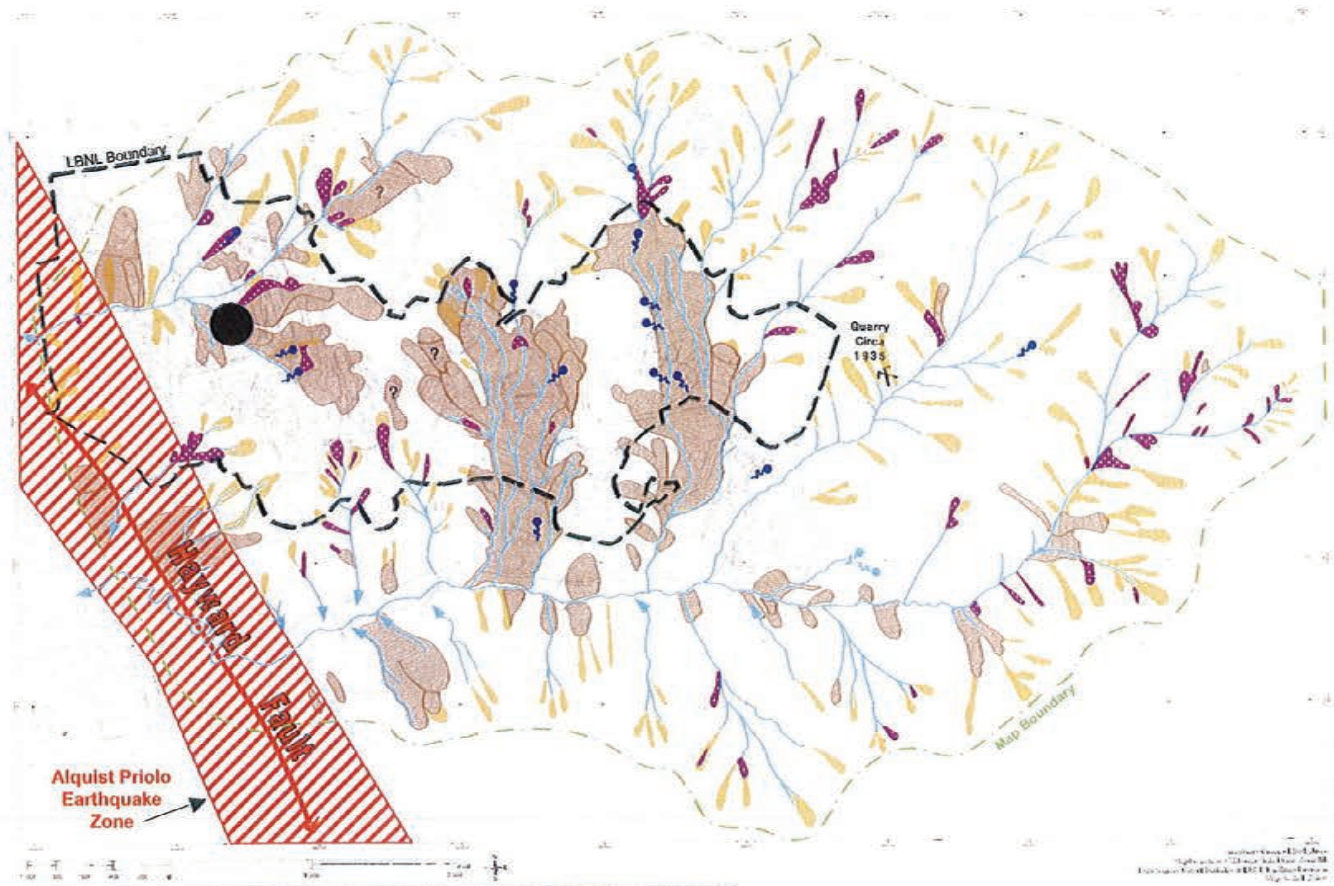
● = INDICATES THE CENTER OF THE BEVATRON ACCELERATOR



Colluvial Hollow: Source Area for Shallow Slides and/or Landslide Scar; Might Have Had Some Activity Within Colluvial Hollow During Last Century.
Earthflow, Slump, or Deep Seated Slide; Includes Area of Crown Scarp; Can include bedrock blocks; Portions of Some Earthflows May be Buried Beneath Alluvial Fans and Colluvium.
Debris Flow or Shallow Slide Active During Last Century
Historic Channel Network and Springs; Springs Adapted from Soule 1895

Laurel Collins, Watershed Sciences, January 2007

AERIAL PHOTOS: Strawberry Canyon, East Bay Regional Park District (1935)
STEREO PHOTOS: BUT-BUU-289 (1939), GS-CP (1946), AV-11 (1947), AV39-29 (1990)
Map of Strawberry Valley and Vicinity (Frank Soule, 1895)
1956 Topographic Map Portions (LBNL, 2000: Figures 4.3.2-2 and C2.2-1)
Hayward Fault from USGS Faults on Google Earth (2007)

FIGURE 13f. INTERPRETATION OF HISTORIC CHANNEL AND LANDSLIDE NETWORK AT LBNL IN STRAWBERRY CANYON

ATTACHMENT 3.

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ATTACHMENT 4.

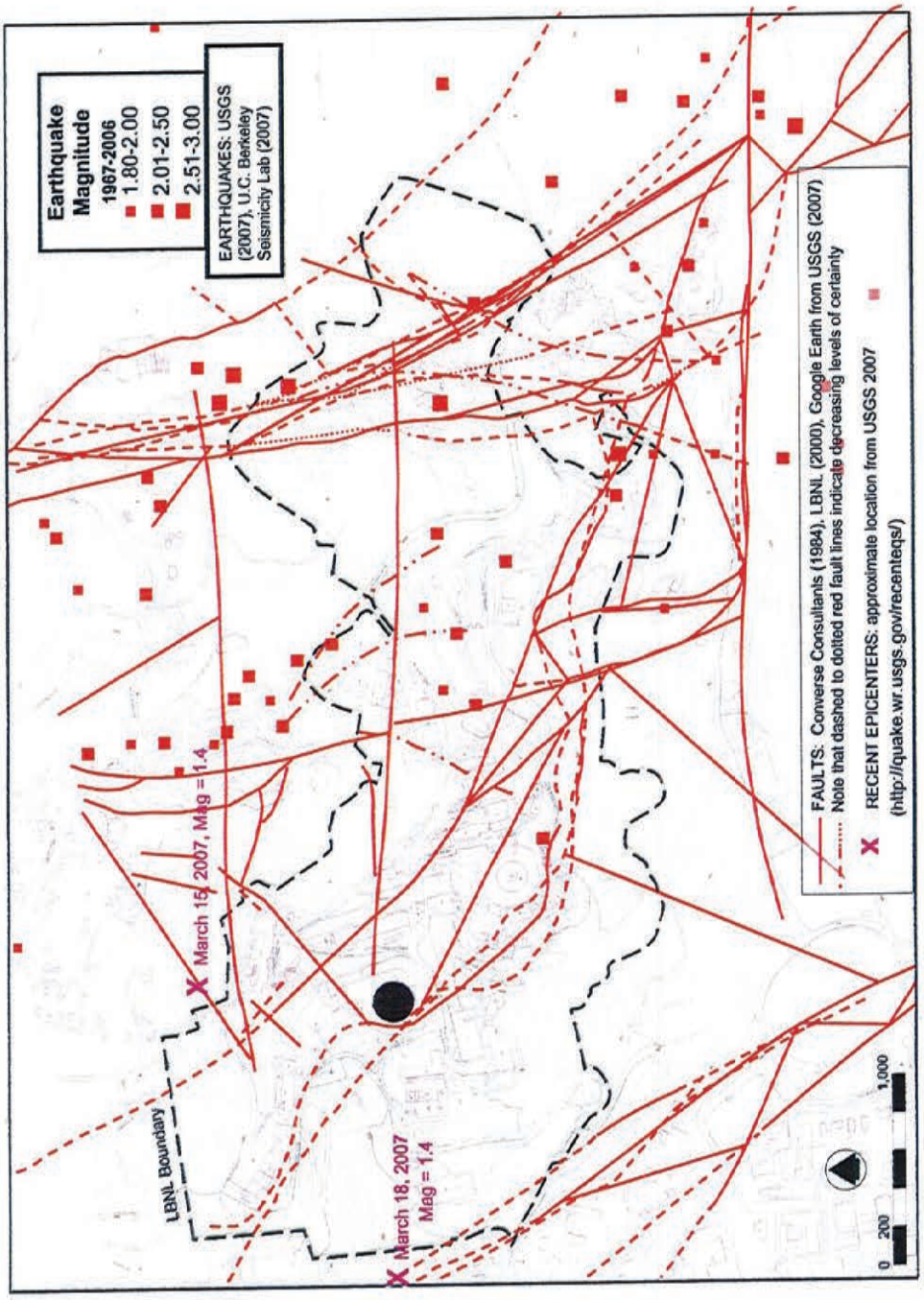

FIGURE 12a. EARTHQUAKE EPICENTERS AND FAULT COMPILATION AT LBNL IN STRAWBERRY CANYON 1967 - 2007

DEVIATION COMPLEX

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AND COMPREHENSIVE INVESTIGATIONS MUST BE COMPLETED TO DETERMINE THE HYDRO GEOLOGICAL REASONS FOR THE CURRENT RISE IN WATER LEVELS AND THE MIGRATION OF CONTAMINATED GROUND WATER INTO CLEAN FILL.

17

THE BEVATRON COMPLEX WAS BUILT DIRECTLY ON TOP OF THE NORTH FORK OF THE STRAWBERRY CREEK AND AT LEAST 3 OF ITS TRIBUTARIES, FED BY 3 SPRINGS. (SEE ATTACHMENT 2.) THE BEVATRON BASEMENT WAS ALWAYS FULL OF WATER AND HAD TO BE CONSTANTLY PUMPED BY SUMP PUMPS.

18

HOW MUCH OF THIS KNOWLEDGE WAS USED WHEN DECISIONS WERE MADE TO BACK FILL THE SITE AND PAVE IT — AFTER DEMOLITION? — HOW MANY AREAS UNDER THE CURRENT PARKING LOT ARE MONITORED FOR THE MIGRATING CONTAMINATION

19

WHAT IS THE LONG TERM PLAN, SINCE WATER IN CREEKS ULTIMATELY FLOWS ALONG THE ORIGINAL CREEKBED?

20

EARTHQUAKE FAULTS AT LBNL — ACT AS BARRIERS AND CONDUITS FOR CONTAMINATED GROUNDWATER (SEE ATTACHMENT 5.)

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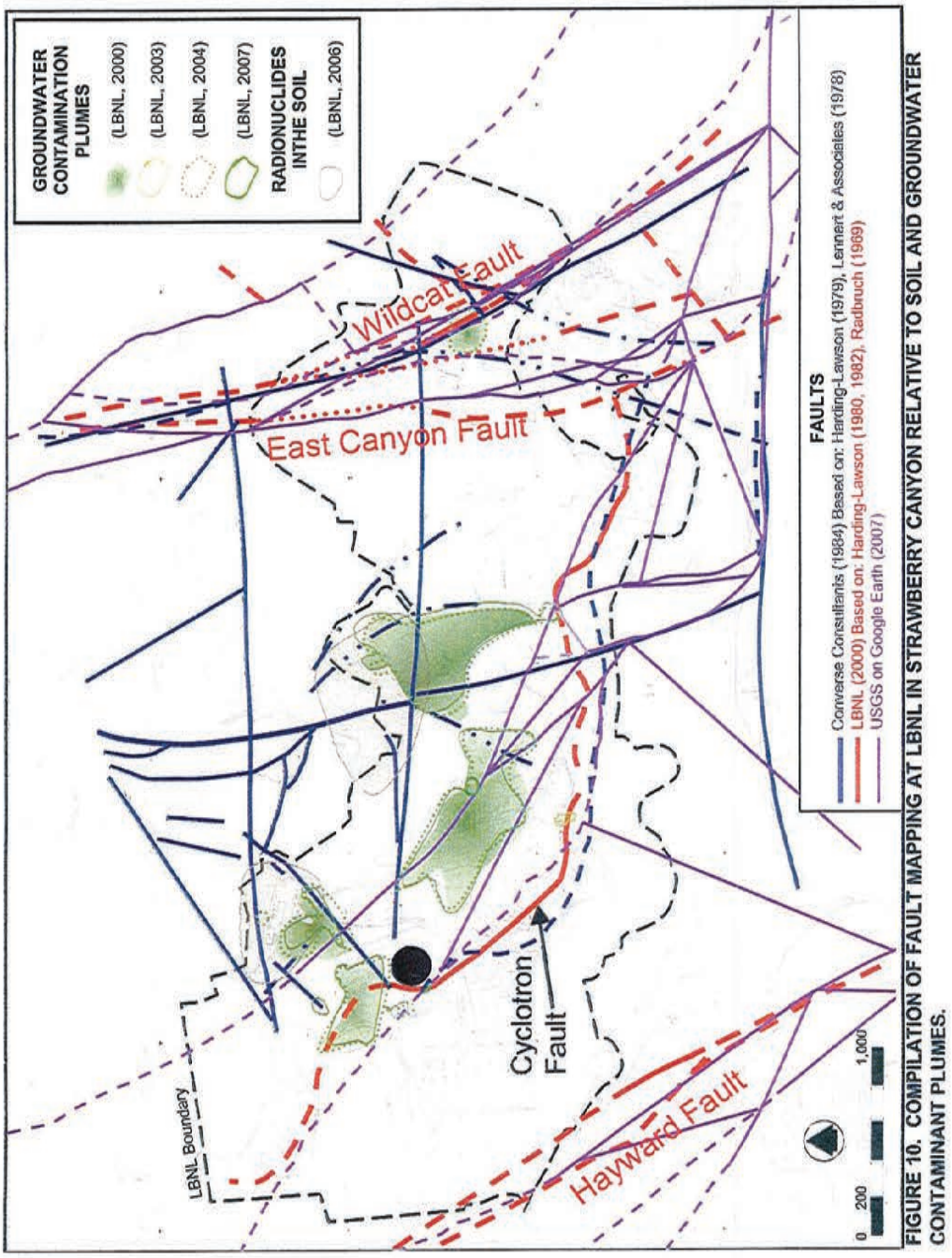

FIGURE 10. COMPILATION OF FAULT MAPPING AT LBNL IN STRAWBERRY CANYON RELATIVE TO SOIL AND GROUNDWATER CONTAMINANT PLUMES.

● = BEVATRON COMPLEX

ATTACHMENT 5.

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IN CMTW'S REPORT: "CONTAMINANT PLUMES OF LBNL AND THEIR INTERRELATIONSHIP TO FAULTS, LANDSLIDES, AND STREAMS IN STRAWBERRY CANYON, BERKELEY AND OAKLAND, CALIFORNIA" — (SEE ATTACHMENT 6.)

WE SHOW POSSIBLE CONTAMINANT MIGRATION ZONES AT LBNL ALONG FAULTS, BEDROCK CONTACTS AND LANDSLIDE AREAS (SEE ATTACHMENT 7.) ~ IT IS CLEAR THAT ALL OF THE CONTAMINANT PLUMES (SEE ATTACHMENT 8.) OF THE WESTERN / CENTRAL PORTION OF LBNL, IF NOT YET, WILL ULTIMATELY JOIN, AND IT APPEARS THAT THE BEVATRON COMPLEX AREA MAYBE THE CENTER FOR THESE WATERS.

21

22

~ WE ASK THAT A COMPREHENSIVE REVIEW, AN EIR BE PREPARED TO ADDRESS THIS SITUATION, AND WE ASK THAT THE FOLLOWING QUESTIONS BE ANSWERED:

23

(1) WHY DID THE WATER LEVEL RISE "SEVERAL FEET"? HOW MANY FEET EXACTLY? WHEN DID THE WATER RISE START? — WAS IT ANTICIPATED IN PREVIOUS PLANS? — IF NOT — WHY NOT?

(2) WHY DID THE CONCENTRATIONS OF VOCs INCREASE? WHERE DID THE CONTAMINATED GROUND WATER ORIGINATE? WHAT IS THE NEXT STEP, IF THE ICMs DO NOT WORK?

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CMTW(1)

CONTAMINANT PLUMES OF THE LAWRENCE BERKELEY NATIONAL LABORATORY AND THEIR INTERRELATION TO FAULTS, LANDSLIDES, AND STREAMS IN STRAWBERRY CANYON, BERKELEY AND OAKLAND, CALIFORNIA

March 2007

Strawberry Creek Watershed ca. 1965

Laurel Collins, Geomorphologist
Watershed Sciences
1128 Fresno Ave
Berkeley, California 94707
collins@lmi.net

● = BEVATRON COMPLEX

for

Pamela Sihvola, Project Manager
Committee to Minimize Toxic Waste
P.O. Box 9646
Berkeley, California 94709

ATTACHMENT 6.

P.10/15 17/30

● = INDICATES THE CENTER OF THE BEVATRON ACCELERATOR

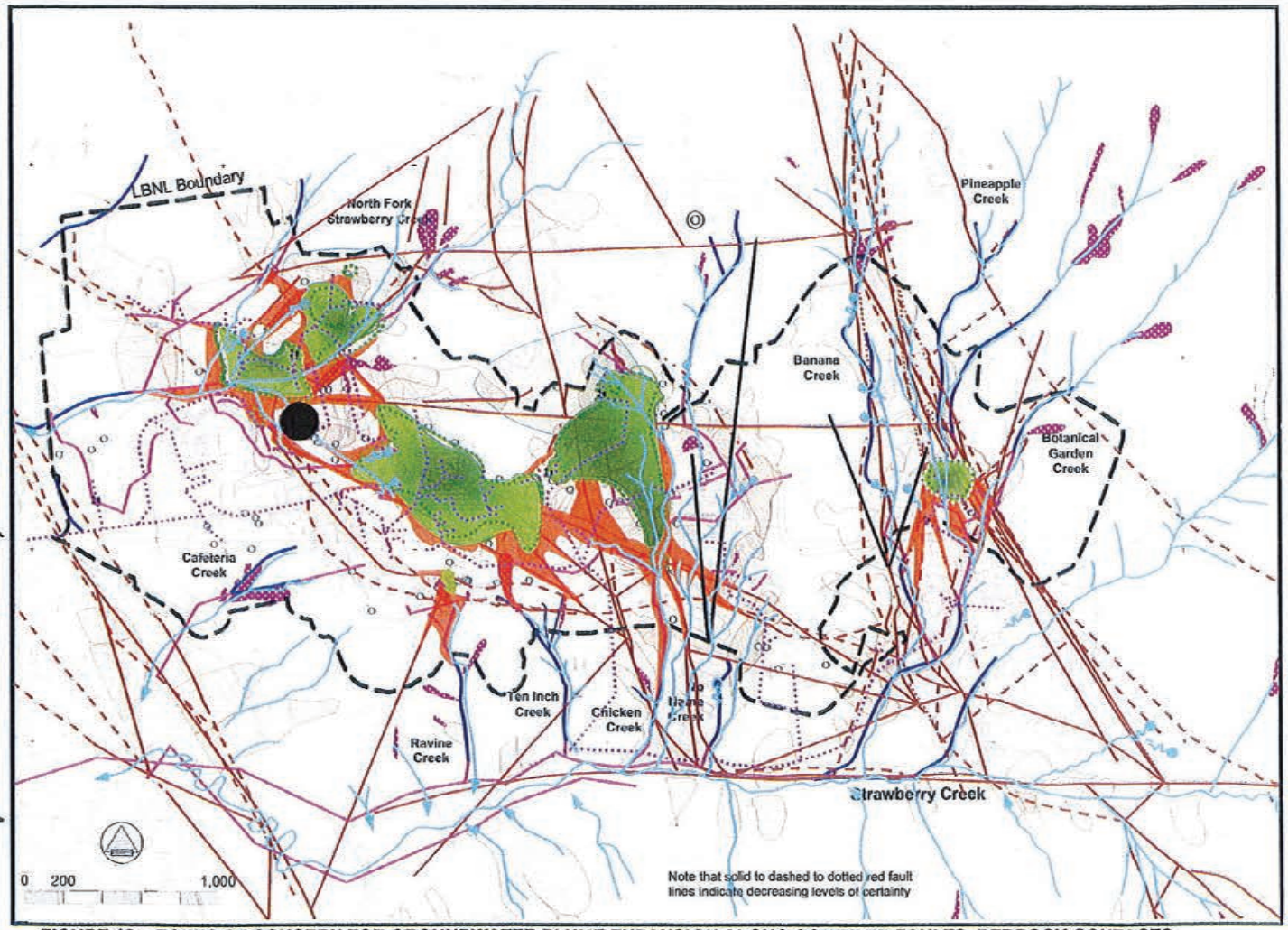

FIGURE 18a. ZONES OF CONCERN FOR GROUNDWATER PLUME EXPANSION ALONG COMPILED FAULTS, BEDROCK CONTACTS,

HYDROLOGY
- Sanitary Sewers (LBNL, 2000)
- Modern Streams (LBNL, 2000)
- Storm Drains (LBNL, 2000)
- Hydraugers (Converse, 1984)
- Shively Well Pumping the Lennert Aquifer (Converse, 1984)
- Historic Drainage Network (Collins,2007)

PLUMES IDENTIFIED BY LBNL
- Contamination Plumes (LBNL, 2000)
- Contamination Plumes (LBNL, 2003)
- Contamination Plumes (LBNL, 2004)
- Contamination Plumes (LBNL, 2007)
- Sampling Wells (LBNL, 2000)
- Radionuclides in the Soil (LBNL, 2006)

ZONES OF CONCERN FOR GROUNDWATER CONTAMINATION
- Possible contaminant migration zone along fault, bedrock contact, or landslide

LANDSLIDES
- Active Shallow Slides (Collins, 2007)
- Deep-seated Earthflow (Collins, 2007)

FAULTS
- Converse Consultants (1984), LBNL (2000), USGS on Google Earth (2007)

FIGURE 18b. LEGEND TO POTENTIAL FACTORS INFLUENCING CONTAMINATED GROUNDWATER PLUME EXPANSION

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ATTACHMENT 7 (A)

CMTW(1)

● = INDICATES THE CENTER OF THE BEVATRON ACCELERATOR

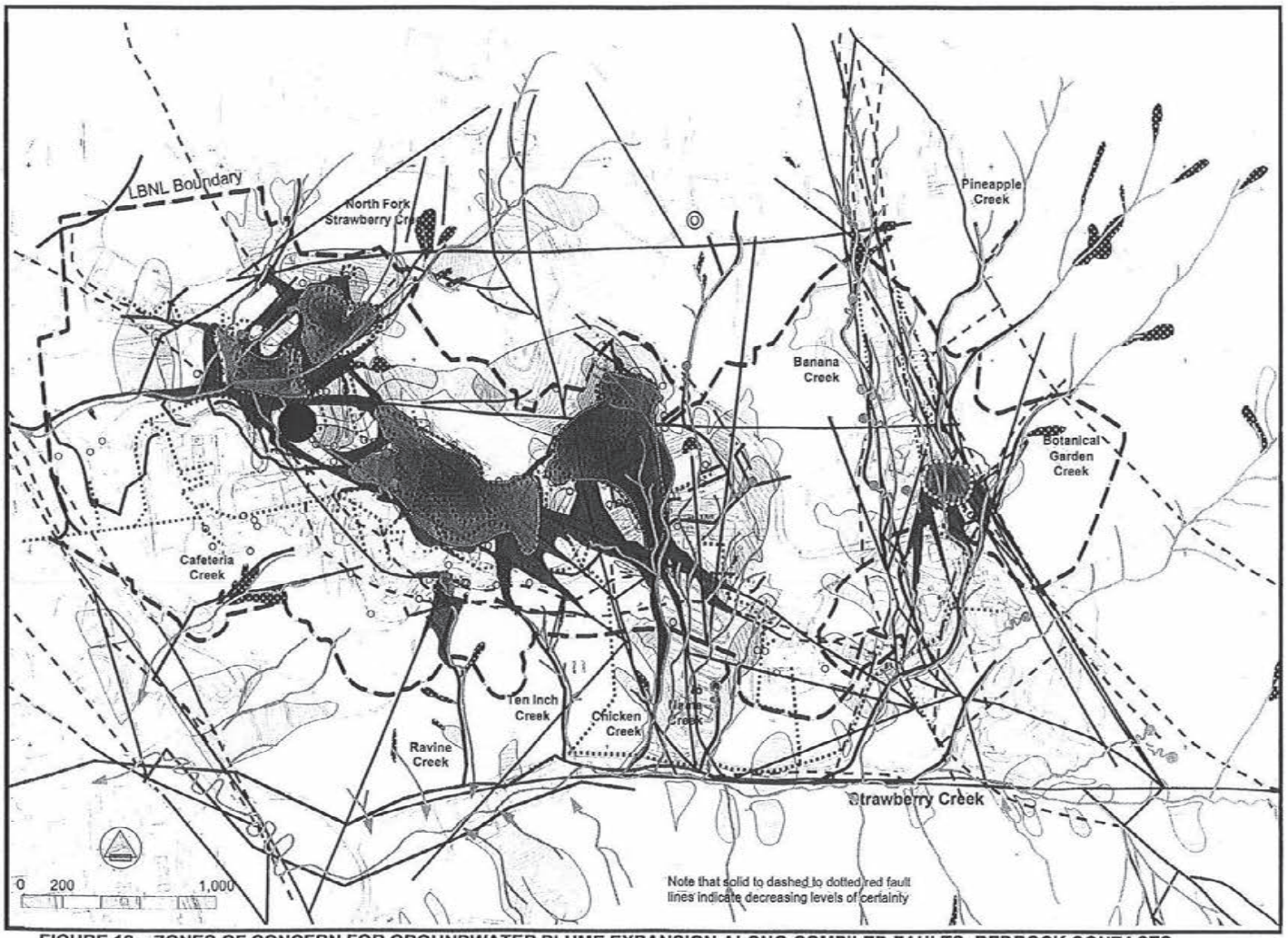

FIGURE 18a. ZONES OF CONCERN FOR GROUNDWATER PLUME EXPANSION ALONG COMPILED FAULTS, BEDROCK CONTACTS, LANDSLIDES, HISTORIC AND MODERN CREEKS. SEE NEXT PAGE FOR MAP LEGEND.

HYDROLOGY
- Sanitary Sewers (LBNL, 2000)
- Modern Streams (LBNL, 2000)
- Storm Drains (LBNL, 2000)
- Hydraugers (Converse, 1984)
- Shively Well Pumping the Lennert Aquifer (Converse, 1984)
- Historic Drainage Network (Collins,2007)

PLUMES IDENTIFIED BY LBNL
- Contamination Plumes (LBNL, 2000)
- Contamination Plumes (LBNL, 2003)
- Contamination Plumes (LBNL, 2004)
- Contamination Plumes (LBNL, 2007)
- Sampling Wells (LBNL, 2000)
- Radionuclides in the Soil (LBNL, 2006)

ZONES OF CONCERN FOR GROUNDWATER CONTAMINATION
- Possible contaminant migration zone along fault, bedrock contact, or landslide

LANDSLIDES
- Active Shallow Slides (Collins, 2007)
- Deep-seated Earthflow (Collins, 2007)

FAULTS
- Converse Consultants (1984), LBNL (2000), USGS on Google Earth (2007)

FIGURE 18b. LEGEND TO POTENTIAL FACTORS INFLUENCING CONTAMINATED GROUNDWATER PLUME EXPANSION

19/20 P. 11/15

ATTACHMENT 7(B)

CMTW(1)

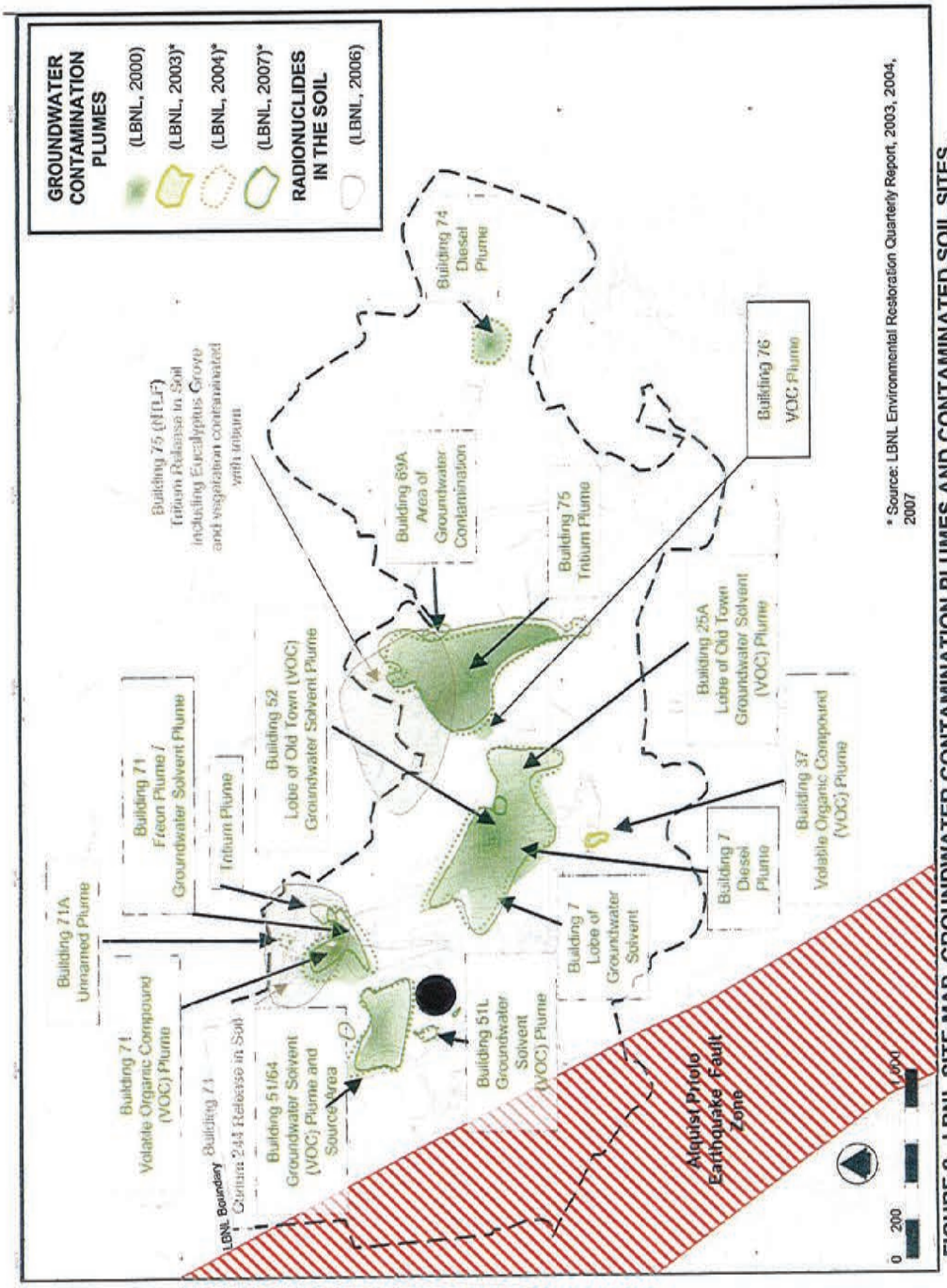

FIGURE 2. LBNL SITE MAP, GROUNDWATER CONTAMINATION PLUMES AND CONTAMINATED SOIL SITES.

● = BEVATRON COMPLEX

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CMTW(1)

— CONTRARY TO DTSC'S FACT SHEET — LBNL IS PLANNING MAJOR DEVELOPMENT, 2 HUGE STRUCTURES TO BE BUILT ON THE BEVATRON COMPLEX DEMOLITION SITE (SEE ATTACHMENT 9.)

— WE THEREFORE ASK THAT DTSC IMMEDIATELY ISSUE DEED-RESTRICTIONS TO THIS PARCEL AND ASK THAT IT WILL BE COMPLETELY FENCED-OFF.

— WE ALSO ASK THAT THE CONCRETE OF THE PARKING LOT BE REMOVED AND THE NORTH FORK OF THE STRAWBERRY CREEK BE DAYLIGHTED, INCLUDING THE SPRING FED TRIBUTARIES, AND THAT THE AREA BE DEDICATED AS OPEN SPACE INTO PERPETUITY.

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— WE ALSO REFER YOU TO THE WEB SITES OF SAVE STRAWBERRY CANYON: WWW.SAVESTRAWBERRYCANYON.ORG AND THE COMMITTEE TO MINIMIZE TOXIC WASTE: WWW.CMTWBERKELEY.ORG (SEE ATTACHMENT 10) FOR MORE INFORMATION.

SINCERELY, Pamela Sihvola

PAMELA SIHVOLA
CMTW
P.O. BOX 9646
BERKELEY, CA 94709

CC: KIM ABBOTT. DOE
BERKELEY SITE OFFICE

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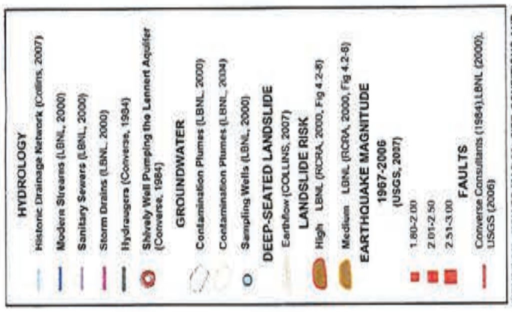

FIGURE 20b. KEY TO MAP 20a SITE CONDITIONS AND FUTURE BUILDING LOCATIONS

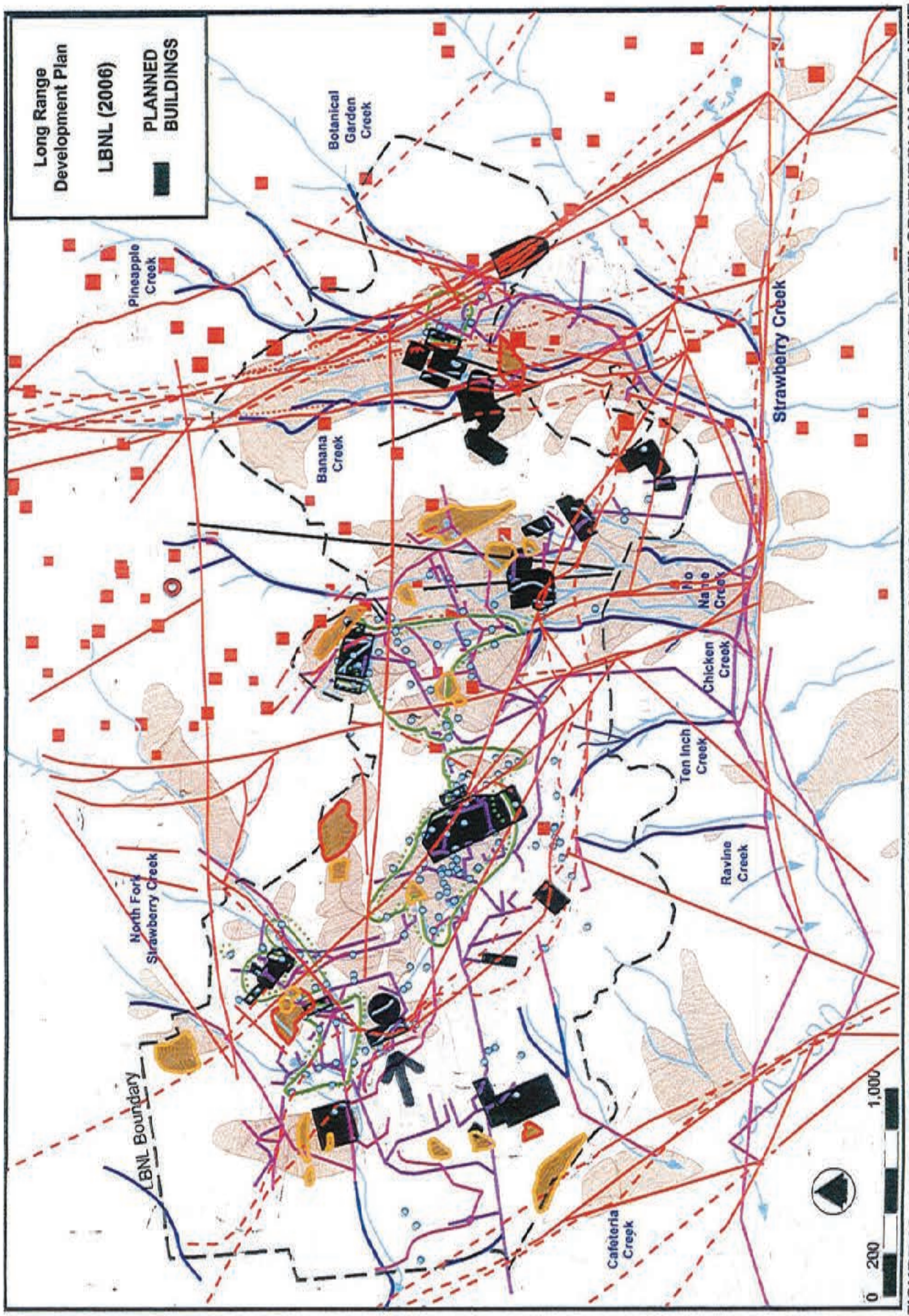

FIGURE 20a. VARIOUS COMPILED SITE CONDITIONS AT FUTURE BUILDING SITES OF LBNL'S LONG RANGE DEVELOPMENT PLAN. SEE NEXT PAGE FOR MAP LEGEND. NOTE THAT SOLID TO DASHED TO DOTTED RED FAULT LINES INDICATE DECREASING LEVELS OF CERTAINTY.

↑ = PROPOSED NEW FUTURE DEVELOPMENT OF THE BEVATRON SITE (I.E. PLANNED BUILDINGS)

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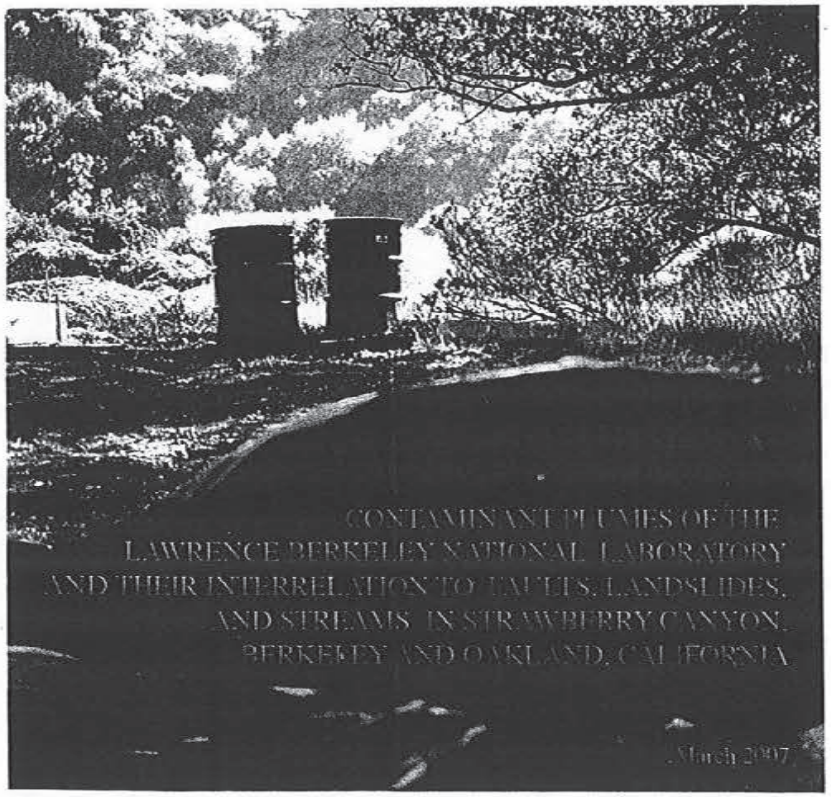

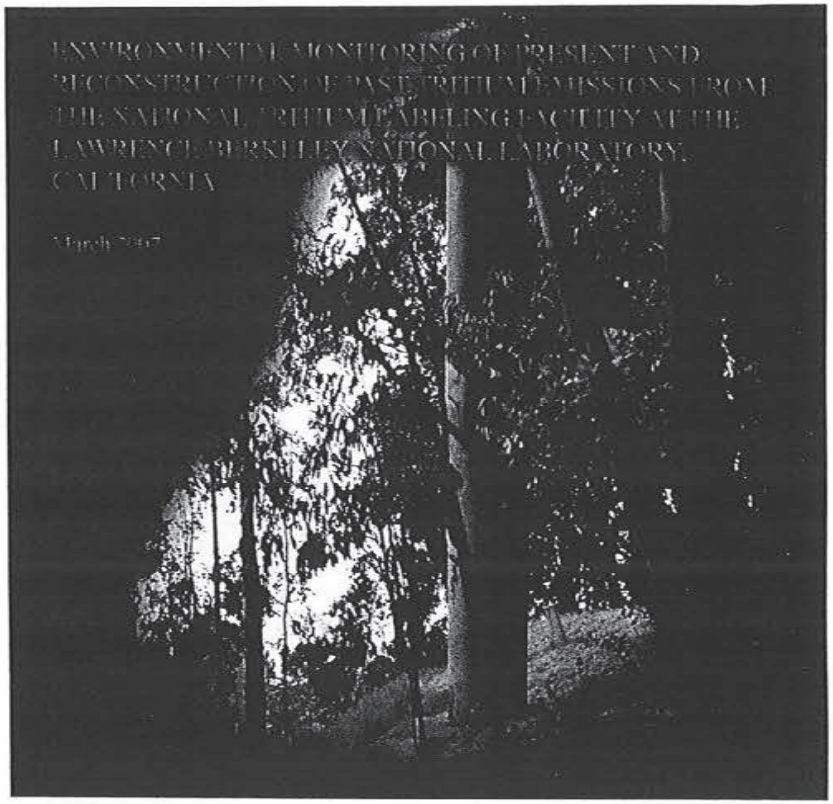

These reports can be found on the web:
http://www.cmtwberkeley.org

or contact:
The Committee to Minimize Toxic Waste
Pamela Sihvola
P.O. Box 9646
Berkeley, California 94709

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ATTACHMENT 10.

CMTW(1)

ATTACHMENT 1 (2p.)

Department of Toxic Substances Control - Fact Sheet

May 2013

COMMUNITY Notice

The mission of DTSC is to protect California's people and environment from harmful effects of toxic substances through the restoration of contaminated resources, enforcement, regulation and pollution prevention

Lawrence Berkeley National Laboratory Interim Corrective Measures Workplan Available for Public Comment

Background

The California Department of Toxic Substance Control (DTSC) has prepared this fact sheet to inform the community about the 30-Day Public Comment Period for the Interim Corrective Measures Workplan to Control the Migration of Contaminated Groundwater at the Bevatron Demolition Project Site (Site) located at One Cyclotron Road in Berkeley, California 94720-8272, Alameda County, California. The purpose of this Work Plan is to provide the rationale and establish the requirements for constructing and operating an Interim Corrective Measure (ICM) in the Vacuum Pump Room area of the former Bevatron Complex at the Lawrence Berkeley National Laboratory (LBNL).

The main LBNL site is located on 202 acres of land within the hillside area, east of the University of California, Berkeley campus. In 1993, DTSC issued a Hazardous Waste Facility Permit to LBNL. As a condition of that permit, LBNL is required to investigate and address all historical releases of hazardous waste and chemicals that may have occurred at the site in accordance with RCRA corrective action process requirements. Investigation of the historical releases, determination of which releases require corrective action, and evaluation/ recommendation of proposed remedies have been completed. In August 2005, DTSC approved LBNL's Corrective Measure Study, which provided remedies for all contamination known at that time to require corrective action.

Building 51, which housed the Bevatron, occupied approximately 2.25 acres in the west-central part of the LBNL Site. During its operation from 1954 until 1993, the Bevatron was among the world's leading particle accelerators. The Building 51 and Bevatron Demolition Project, which began in 2010, consisted of the demolition, deactivation, and disposal of the Building 51 structure and contents; including the shallow foundations, shield blocks, and the Bevatron accelerator housed within the building. Following demolition, the site was backfilled to grade with clean soil. Between September 2010 and April 2011, LBNL conducted a preliminary investigation of potential subsurface contamination beneath the Building 51 Demolition Project area.

Public Comment Period

Public Comment Period

We encourage you to review the Draft ICM Workplan and proposed Negative Declaration. DTSC is holding a 30-day public comment period for the ICM beginning May 7, 2013 All comments must be postmarked by June 7, 2013. All e-mailed comments must be received no later than 5:00 pm on that same day.

Please submit written comments to:
Jacinto Soto
DTSC Project Manager
700 Heinz Avenue
Berkeley, California 94710
Call 510-540-3842 or
Email Jacinto.Soto@dtsc.ca.gov

Cal/EPA DTSC State of California

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During this preliminary investigation, relatively high concentrations of volatile organic compounds (VOCs) were detected in the soil and groundwater under the former Vacuum Pump Room area of Building 51. The project area is primarily referred to as Building 51 in the workplan, but is also referred to as the Bevatron Complex or simply as the Bevatron. Building 51 included Building 51A, an integral addition. Except for the area overlying the former Vacuum Pump Room, the project area has been paved to provide parking, and is not currently scheduled for development.

Objective of the ICM

The objective of the ICM is to control the migration of contaminated groundwater from the former Vacuum Pump Room area of the Bevatron. The groundwater level in the eastern end of the backfilled Bevatron Air Duct shafts has risen several feet since demolition of the Bevatron was completed. This groundwater is contaminated with trichloroethylene (TCE), cis-1,2-dichloroethene (DCE), 1,1,1-trichloroethane (TCA), and vinyl chloride. The results indicate that since demolition of the Bevatron and backfilling of the Air Duct shafts, contaminated groundwater has migrated from the former Vacuum Pump Room area into the clean Air Duct backfill.

Summary of Existing Conditions

The description of existing conditions in the Vacuum Pump Room area is based on environmental investigations conducted between September 2010 and December 2011. The investigations included soil vapor, soil, and groundwater sampling. . The results of these investigations are reported in detail in the Report of Environmental Investigations in the Building 51A and Vacuum Pump Room Areas for the Building 51 and Bevatron Demolition Project and are summarized in the following subsections.

Potential Risk to Human Health

Currently, there is no significant risk to human health associated with VOC contamination detected in the former Vacuum Pump Room area. The potential exposure pathways relevant to human health risks are inhalation due to vapor intrusion into indoor air and/or direct contact with contaminated soil. Groundwater at LBNL is not used for drinking, irrigation, or other industrial or domestic purposes.

VOCs have been detected in soil vapor and groundwater at concentrations well above screening levels for potential risk to potential future indoor workers via the vapor intrusion pathway. However, there is no risk to current workers since this pathway is not complete because there are no buildings overlying the areas where the screening levels are exceeded

Concentrations of VOCs in the soil exceed screening levels for direct contact by outdoor workers in two limited locations in the former Vacuum Pump Room area. Both of these locations have been posted with warning signs requiring Hazardous Waste Operation (HAZWOPER) training for any worker handling soil in the posted area.

Potential Risk to the Environment

Since demolition of the Bevatron and backfilling of the Air Duct shafts, contaminated groundwater has been migrating from the former Vacuum Pump Room area into the clean Air Duct backfill. Although a replacement subdrain system that was installed under the central Bevatron area during the demolition project may capture the migrating groundwater, the potential impact to the clean Air Duct backfill before that barrier is reached is considered to be an imminent threat to the environment, and is therefore the subject of this ICM.

System Design

The ICM will comprise construction of an extraction well in the former Vacuum Pump Room area, extraction of groundwater from the new extraction well and existing observation well, and treatment of the extracted groundwater at the existing Building 51 Motor Generator Room Treatment System. This treatment system was approved as part of the November 2005 Corrective Measures Implementation Workplan.

Extraction Well

A 2-foot diameter groundwater extraction well will be drilled to a depth of 20 feet (approximately 10

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feet beneath the Air Duct floor) inside the southern part of the former Vacuum Pump Room upgradient from the Air Duct shafts. Three contiguous 2-foot diameter borings will be drilled immediately adjacent to the extraction well and will be backfilled with drain rock to enhance the yield of the extraction well. The multiple large-diameter borings are required for groundwater extraction due to the low hydraulic conductivity of the artificial fill and bedrock beneath the former Vacuum Pump Room location.

Informational Repositories

Department of Toxic Substances Control Berkeley
File Room
700 Heinz Avenue
Berkeley, CA 94710
(510) 540-3800 Call for Appointment

Berkeley Public Library
2090 Kittredge Street
Berkeley, CA 94704
(510) 981-6100
Call for hours and days of operation

Envirostor Link

To view electronic versions of the ICM Workplan, visit DTSC's Envirostor website: http://www.envirostor.dtsc.ca.gov/public Enter "Berkeley" in the city section and select "Lawrence Berkeley National Laboratory" from the alphabetical list of sites.

For More Information

Jacinto Soto
DTSC Project Manager
700 Heinz Avenue
Berkeley, CA 94710
(510) 540-3842
Jacinto.Soto@dtsc.ca.gov

Richard A Perry
DTSC Public Participation Specialist
700 Heinz Avenue
Berkeley, CA 94710
(510) 540-3910
Richard.Perry@dtsc.ca.gov

Notice to the Hearing Impaired

TDD users can use the California Relay Service at (888) 877-5378 and ask to speak with Richard Perry at (510) 540-3910.

Annuncio

Si prefiere hablar con alguien en español acera de ésta información, favor de llamar a Jacinto Soto, Departamento de Control de Substancias Tóxicas, al número de teléfono (510) 540-3842.

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ATTACHMENTS :

#1 DTSC FACT SHEET
RE: LBNL INTERIM CORRECTIVE
MEASURES WORKPLAN, DATED MAY 2013

#2 SF CHRONICLE ARTICLE
TITLED: BEVATRON'S FUTURE BEING DEBATED
DATED JUNE 29, 2006

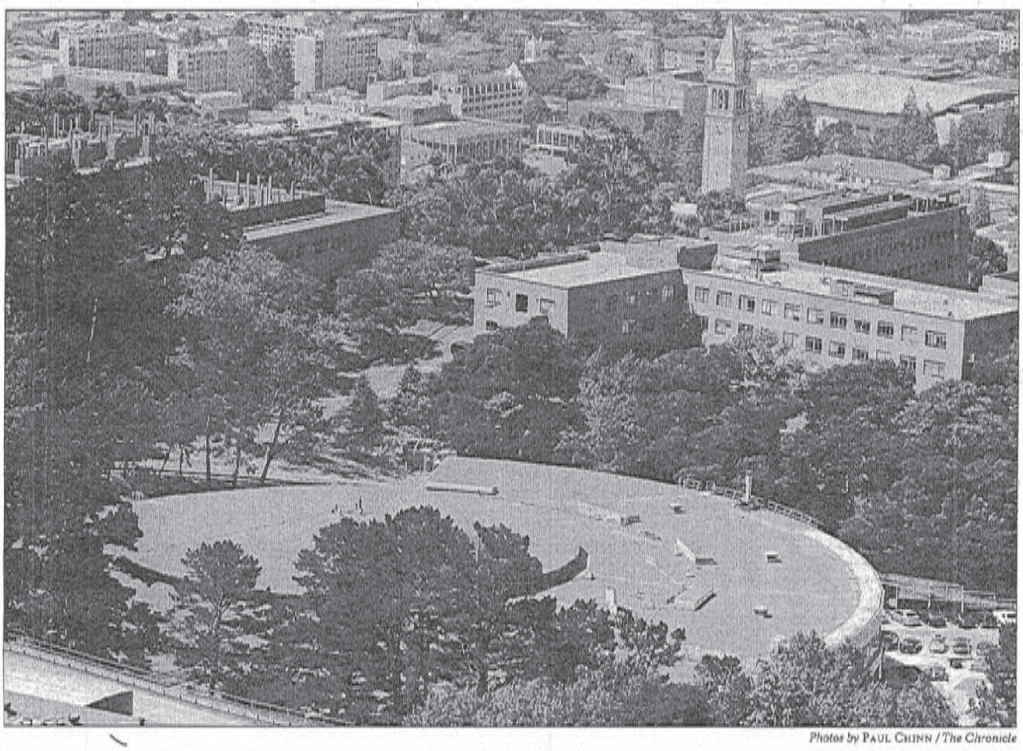
#3 NATURE ARTICLE
TITLED: VIEWS COLLIDE OVER FATE OF ACCELERATOR
DATED AUGUST 10. 2006

30/30

ATTACHMENT 2. (2p.)

San Francisco Chronicle

sfgate.com THURSDAY, JUNE 29, 2006 415-777-111



Photos by PAUL CHINN / The Chronicle

Lawrence Berkeley National Laboratory wants to tear down the building that once housed the Bevatron accelerator (foreground).

BERKELEY

Bevatron's future being debated

Some want to make former particle accelerator a landmark

By Rick DelVecchio
CHRONICLE STAFF WRITER

Until it was shut down in 1993, a 10,000-ton magnetic doughnut known as the Bevatron smashed atoms under tight security for 39 years in the Berkeley hills.

It was one of the giant machines that America built for physicists to continue their atomic research after the bomb ended World War II. Because it was off limits to the public for most of its history, few people know much about what happened inside the Bevatron, housed inside a 180-foot-wide domed building.

Now, the U.S. Energy Department's Lawrence Berkeley National Laboratory wants to demolish what's left at the site to make room for unspecified future projects, but some locals are pushing to save the facility as a historic landmark.

City officials and some residents want the national lab to fully document the historic value of a site that contributed to four Nobel Prize-winning research projects and sustained Berkeley's status as a center of physics research during most of the Cold War against the Soviet Union.

Among those pushing for the information is Lesley Emming-

▶ BEVATRON: Page B9

Some of the items at the Cold War research site still contain radioactive materials.

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San Francisco Chronicle

BAY AREA AND CALIFORNIA

SECTION B

Thursday, June 29, 2006

CONTACT US
► Ken Conner, Metro Editor
metro@sfchronicle.com
(415) 777-7100

ONLINE
► sfgate.com/news

Some want to turn particle accelerator site into landmark of Cold War research

► BEVATRON
From Page B1

ton, a member of the Berkeley landmarks commission, which will hold a hearing July 6 to decide whether to give local landmark status to the site.

"It's been interesting to learn about the significance of the Bevatron," Emmington said. "We've been presented with interesting material for a place no one in town has seen."

About 50 Berkeley residents have signed a petition calling for local landmark status. Such a designation wouldn't be binding on the national lab, but proponents hope it would lead lab officials to consider preservation as an alternative to demolition.

"It was the very first nuclear lab established in the country," said Pamela Sihvola, one of the residents behind the petition. "It played a significant role in the development of nuclear weapons. The Bevatron was one of the first buildings that really symbolized the Cold War science era."

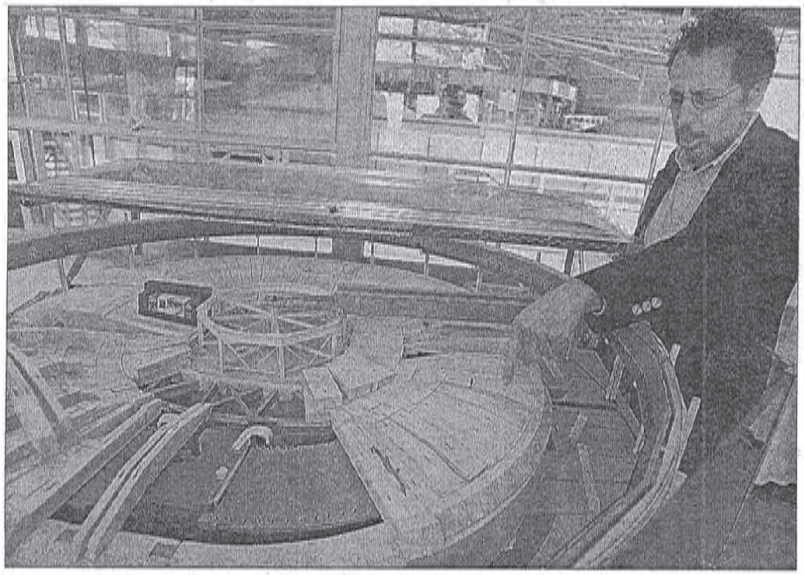
Sihvola believes the lab eventually will become part of the UC campus and accessible to the public. She said Lawrence Berkeley officials should plan ahead and consider preserving the Bevatron as a science museum.

"You don't understand the history of the area without having that building there," she said. "A plaque doesn't give future generations a real sense of how this huge Cold War science operated."

Mark McDonald, a member of Berkeley's Peace and Justice Commission, thinks the Bevatron could be a resource for high-school science classes. "What a killer day trip," he said.

The device got its name from its ability to accelerate protons to an energy of 6 billion electron volts, abbreviated as BeV, hence Bevatron. The Bevatron is eligible for the National Register of Historic Places and is amply documented in a Historic American Engineering Record — a scholarly narrative in words and pictures available online at the Library of Congress.

The narrative describes the Bevatron as the world's most powerful accelerator when it opened in 1954. It was designed to whip protons around a circular track at near-light speed. The resulting collisions revealed new particles never before seen, notably the anti-proton, a fleeting subnuclear particle. Its discovery in 1955 helped establish the reality of anti-matter.



Feinberg uses a scale model to explain how the Bevatron worked. It was decommissioned in 1993.

The Bevatron was one of many machines built to continue the government's partnership with physicists after World War II. The arms race with the Soviet Union was on and there was popular support for bigger and better machines for physicists to use.

Berkeley did well in the competition with other research sites, led by physicist Ernest Lawrence, who won the Nobel Prize in physics in 1939 for his invention of the cyclotron. His work also contributed to the Manhattan Project's success in isolating uranium to fuel the first A-bomb.

According to the narrative, the government, for its part, was happy to support the experienced Berkeley scientists after the war so they could be mobilized in a future national emergency.

Lawrence Berkeley officials disagree that it makes sense to preserve the building for historic purposes. They say the public is best served with the antiquated structure removed and the site swept of such toxic materials as asbestos and concrete insulating blocks contaminated with low levels of radiation. They feel most people in Berkeley agree it's time to clean up a vacant industrial site and move on to something new.

"The best monument in my opinion as a scientist would be to build a new facility that would allow groundbreaking new science," said Benedict Feinberg, a senior staff physicist at the lab.

"With respect to whatever new facility goes in here," he said, "the first thing you do on a tour is give homage to the history of the site. You talk about the Nobel Prizes, the discovery of the anti-proton, and so on, that happened on this site. I think that's a much more fitting monument than an old, decaying, hazardous structure."

Lab officials say that even if the building were preserved, the public would be at risk from exposure to hazardous materials. What's more, the lab has been buttoned down for security reasons since the Sept. 11 attacks, and all visitors have to be authorized.

"The only thing significant about putting it here is this is the site of the original facility," said Joseph Harkins, the lab's manager for the Bevatron demolition project. "A monument for learning purposes would be better put in a location that we're sure is accessible to the public."

The Bevatron's accelerator and control room were dismantled after the installation was closed. What remains of the interior are the magnets that circulated the particles and rings of concrete blocks that shielded scientists from radiation. The building itself, an example of a utilitarian industrial structure designed solely to accommodate machines, is now a roost for birds.

The most evocative scenes of the Bevatron today may be in the form of historic photos from the '50s and early '60s, when the Bevatron was the biggest machine of its kind. One image from 1954 shows an operator in the Bevatron's control room, dwarfed by banks of knobs, dials and oscilloscopes.

The lab's plans call for the Bevatron's removal to begin in 2008. The job would take four to seven years and as many as 4,700 one-way truck trips on city streets.

Nabil al-Hadithy, the City of Berkeley's hazardous materials manager, said vehicle emissions and dust from the hauling pose a serious health risk for the elderly, very young children and people with weak hearts. He has proposed that the lab use low-sulfur fuels or alternative fuels to lessen the impact on vulnerable people living on truck routes.

E-mail Rick DelVecchio at rdelvecchio@sfchronicle.com.

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10 August 2006 www.nature.com/nature | $10 THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE

nature

NEWS

Views collide over fate of accelerator

Its parts have been dismembered, its roof is leaking, and a wall is missing. Now activists and scientists are squabbling over whether to completely raze the Bevatron — one of the most important particle accelerators ever built.

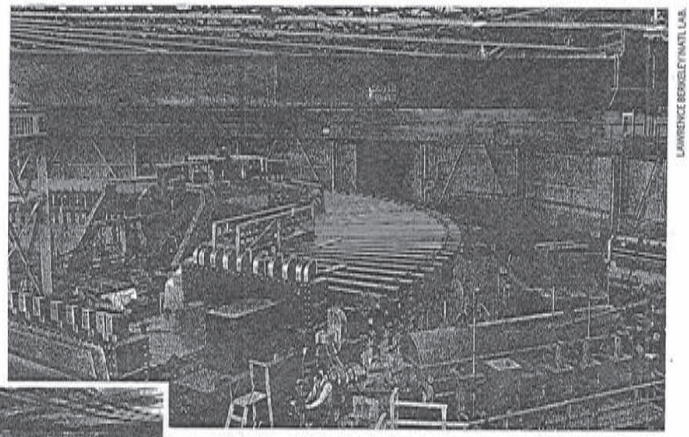
The remains of the Bevatron, which was decommissioned more than a decade ago, take up prime real estate on the Lawrence Berkeley National Laboratory's campus in Berkeley, California. Scientists at the lab want to tear it down to make way for fresh projects. But locals, many of whom oppose the demolition because of concerns about the possible release of contaminants, say they want to see it made into a museum.

On 3 August, the city council's Landmarks and Preservation Commission dealt a blow to those wanting landmark status for the accelerator by voting to recognize the Bevatron's legacy without protecting the building. Nevertheless, landmark advocates have vowed to continue fighting.

"It's truly a landmark, a very unique building," says Mark McDonald, who sits on the City of Berkeley's Peace and Justice Commission. "Somebody called it the world's largest yurt." The Bevatron, which from above looks not unlike a traditional Mongolian tent, began its life in 1954, smashing protons into a fixed target. A year after it opened for operation, physicists Emilio Segrè and Owen Chamberlain used it to discover the antiproton (see 'Bevatron's greatest hits'), for which they were awarded the Nobel prize in 1959. Over the next 40 years, other scientists used the Bevatron to study the violation of particle symmetry, as well as particle resonances, a phenomenon that eventually led to the quark model of matter.

But the machine had trouble keeping up in the fast-moving world of high-energy particle physics. Attempts to improve it were constrained by space restrictions — caused by the Berkeley Laboratory's placement on a steep hillside and close proximity to the city of Berkeley below. Over time it was gradually eclipsed by larger accelerators at other labs. In its last decades of operation, it was used to conduct biological research, including assessing the radiation risks associated with space flight. It was eventually shut down in 1993 due to budget shortfalls.

Since then, it has been taking up precious space on the Berkeley Lab's relatively small campus, according to Benedict Feinberg, a physicist there who served as the Bevatron's director for 1989–93. The laboratory recently got the $90 million needed to remove the machine, and is currently pursuing its demolition. "The value of the Bevatron is for the science that was done there," says Feinberg. "The building is nothing really special."



LAWRENCE BERKELEY NATL LAB.

Divided: physicists hope to reclaim the space but local groups want landmark status for the Bevatron.

Feinberg declined to comment on the latest interest in preserving the building, but some lab officials quietly believe that it's the walls, not the accelerator, that are of real concern to local groups. The building was constructed using transite, a composite of asbestos and cement, which releases asbestos fibres when it is broken up. Community members have expressed fears that razing the Bevatron would involve moving large amounts of loose asbestos through the city of Berkeley. Environmentalists also fear that lead and other contaminants from the building site could escape into the water table.

Pamela Sihvola, who co-chairs the Committee to Minimize Toxic Waste — a local watchdog group that monitors the laboratory — is among those pushing to preserve the Bevatron. "The EPA says that the best way to deal with lead and asbestos is to manage it in place," she says. "All we want the laboratory to do is consider a re-use alternative," she says. "It could be a living science museum and education centre." Chamberlain supported the idea, and even wrote a letter advocating the conversion of the Bevatron before his death in February, she notes.

McDonald adds that the centre would immortalize the Berkeley Lab's most famous work. "We haven't had a lot of Nobel prizes up there lately," he says. "There's nothing wrong with paying a tribute."

But Feinberg disagrees. With limited space, he argues, the Bevatron site is more valuable to lab researchers than the ageing machine it contains. "A fitting memorial," he says, "would be to re-use that site to do cutting-edge science."

The lab is now preparing the environmental-impact statement needed to proceed with demolition. Sihvola is gearing up for a fresh round of debate with the full city council: "Our attempts to preserve the building will continue," she vows. ■

Geoff Brumfiel

Bevatron's greatest hits

Most of the discoveries made in the Bevatron occurred early on in its 40-year history.

1955 Owen Chamberlain and Emilio Segrè use the Bevatron to find the antiproton, for which they win the Nobel prize in 1959.

1956 Bruce Cork's team discovers the antineutron using the accelerator.

1956 Tsung-Dao Lee and Chen Ning Yang suggest using the Bevatron to test 'parity violation', the idea that some laws of nature are not symmetric.

1960 Bogdan Maglich reports a unique particle called Y*(1385), which points to the existence of quarks.

A.J. SISCO/UPI PHOTO/NEWSCOM

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Committee to Minimize Toxic Waste, Pam Sihvola, dated March 23, 2015

Response CMTW (1)-1

The commenter quotes a statement that no more buildings should be constructed in either the Strawberry Canyon or the Blackberry Canyon at the Lawrence Berkeley National Laboratory (LBNL) site due to the unstable geological conditions of the LBNL site. The commenter also quotes the hypotheses put forward by University of California Berkeley (UCB) Professor Emeritus Garniss Curtis (in an article published in the Berkeley Daily Planet in the autumn of 2008 and a letter submitted to the Regents of the University of California in the spring of 2008). In his article, Professor Emeritus Curtis argued that the LBNL site is underlain by a volcanic caldera containing material with low strength. The Committee to Minimize Toxic Waste (CMTW) comment letter also presents a hand-drawn, geologic cross-section of the LBNL site, which portrays most of the LBNL site as underlain by volcanic rock filling a caldera. In this drawing, the hypothesized collapsed caldera deposit (i.e., in-fill) is shown to be hundreds of feet thick and made up of volcanic rocks mixed with ash and debris. The volcanic rock filling the caldera is portrayed as having cavern-sized voids filled with water.

A comprehensive bedrock geology map of the entire LBNL site was prepared by Parsons Engineering Science, Inc., (PES) and UC LBNL in 2000. The mapping data used to prepare the map was drawn from hundreds of borings as well as from trenches, outcrops, construction excavations, and road cuts (PES and UC LBNL 2000). This map indicates that volcanic rocks do not underlie most of the LBNL site, but rather occur in various isolated to semi-isolated masses. Calculations from this map indicate that 46 acres of the 202-acre site, or 23 percent of the LBNL property, is underlain by volcanic rock, sedimentary rock intercalated with volcanic rock, and sedimentary rock including volcaniclastics (a type of rock that contains volcanic material). The majority of these 46 acres are currently not developed, and the UC LBNL and DOE do not anticipate further development in these areas.

The theory that volcanic rocks at LBNL originated in an alleged caldera collapse is not borne out in the geologic observations of the LBNL site. A geologic section through the LBNL site was prepared by PES and UC LBNL in 2000, again based on data from many years of borings, outcrops, road cuts, and construction excavations. That cross section shows that the thickest volcanic masses at the site are less than 100 feet thick rather than hundreds of feet thick. Further, none of these masses is in contact with Cretaceous strata as portrayed in the video, but rather are underlain by the Tertiary Orinda Formation. Strata in this formation dip moderately to the northeast across all but the very eastern portion of the site indicating structural continuity that does not accord with these strata being blocks within a collapsed caldera.

Volcanic masses at LBNL do not contain the high proportion of tuff (consolidated volcanic ash) indicative of collapse synchronous with eruption that is a defining feature of collapsed calderas. Further, none of the breccias (coarse angular volcanic fragments) observed at LBNL exhibit the welding expected to occur in at least some of them had they been formed in a caldera coincident to eruption. In short, the geometry of the volcanic rock masses does not accord with a caldera collapse origin.

Another part of the caldera hypothesis is the contention that caldera-filling rock masses are weak, as having little to no strength and as thus unsuitable to support structures. Setting aside that there is not a scientific consensus that caldera-filling rock masses are particularly weak, and

setting aside that the evidence does not indicate there are collapsed caldera deposits at LBNL, the geomorphology developed on the volcanic rocks at and in the vicinity of the LBNL site is not consonant with supposing these rocks are essentially a fluid, or even relatively weaker than the surrounding rocks. On the contrary, these rocks underlie promontories, such as that occupied by the Lawrence Hall of Science and the naturally occurring sidehill bench upon which the first cyclotron building was constructed at LBNL. These geomorphic features indicate this material generally has higher strength and erosion resistance than the surrounding materials rather than lower strength.

With respect to aquifers and/or perched bodies of subsurface water, particularly in the volcanic rock, that are depicted in Figure 1 (included in the comment letter), hydrogeologic conditions at LBNL have been thoroughly investigated as part of LBNL's Environmental Restoration Program (ERP). These investigations have found that, as is typical throughout the San Francisco Bay Area, groundwater exists at LBNL within pores between sediment particles, such as between the grains of sand in sandstone, and rock fractures that are generally "smaller" to "much smaller" than a millimeter across. The investigations have also determined that the volcanic rock at LBNL is among the rock units with the highest permeability at the site, but well within the range of permeabilities for geologic materials in general. In addition, high permeability is not recognized by engineering geologists and geotechnical engineers as correlating significantly with slope instability. For instance, drainage of groundwater relieves the water pressure that contributes to slope instability, and groundwater drains more quickly from higher permeability materials. While groundwater conditions at LBNL can contribute to slope instability, particularly during and after intense precipitation events, no particularly adverse groundwater conditions relative to other hilly locations in the Bay Area have been encountered.

Geologic maps and cross sections contained in the geotechnical investigation report for the IGB (A3GEO 2014) indicate that the IGB site is not underlain by volcanic rocks. Bedrock that underlies the IGB site is of the Tertiary Orinda Formation, which is a sedimentary rock unit. Borings deep as 144 feet have been drilled from the level of the pad on which the IGB is planned to be sited. Data from the borings provide no evidence of volcanic rocks, large voids, or unstable geologic conditions at the planned location of the IGB. In short, the planned IGB site has been extensively investigated and found to be geologically stable and well-suited for the planned construction.

Response CMTW (1)-2

See **Response to Comment CMTW (1)-1,** above.

Response CMTW (1)-3

Comment noted. See **Response to Comment CMTW (1)-1,** above.

Response CMTW (1)-4

The commenter states that the LBNL site lies between the Hayward and Wildcat Canyon faults and between Strawberry Canyon and Blackberry Canyon, and that the site is underlain by a collapsed caldera. With respect to the theory that a collapsed caldera is located at LBNL and that the volcanic caldera materials are unstable and not suitable for construction of large structures, please see **Response to Comment CMTW(1)-1,** above.

The commenter also argues that this area is unstable and that there is evidence of displacement along and below the Hayward fault. Regarding the Hayward fault, as noted in the IGB Environmental Analysis and Checklist Section 5.6 Geology and Soils, the proposed IGB project is located at least 1,000 feet away from the closest known or suspected active fault trace of the Hayward fault and the IGB site is well outside of the official Alquist-Priolo Fault Hazard Zone that surrounds the Hayward fault. Nevertheless, fault rupture or displacement along or below the fault, while not a direct issue at the immediate project site, and related matters have been fully addressed in the 2006 Long Range Development Plan (LRDP) EIR Section IV.E Geology and Soils; in IGB Environmental Analysis and Checklist Section 5.6 Geology and Soils; and in the IGB Geotechnical Investigation Report (A3GEO 2014). Please see **Response to Comment CMTW (1)-5**, below.

Response CMTW (1)-5

The comment regarding the probability of a major earthquake on the Hayward fault is noted. Page 56 of the IGB Environmental Analysis and Checklist provides a subsequent estimate of the probability of a major earthquake on the Hayward fault which was reported by the US Geologic Survey (USGS) Working Group in 2003 to be 27 percent. As stated in the IGB Environmental Analysis and Checklist, LRDP Mitigation Measure GEO-2, which requires a site-specific, design-level geotechnical investigation to occur during the design of any proposed buildings and for geotechnical recommendations to subsequently be incorporated into building design, was adopted as part of the 2006 LRDP and is a standard project feature of the proposed project. Pursuant to LRDP Mitigation Measure GEO-2, a geotechnical investigation was completed for the IGB project in September 2014. According to the geotechnical report, the IGB site is relatively free of geologic hazards other than earthquake ground shaking; a hazard shared through the region that is routinely mitigated through the seismic design provisions of the California Building Code (CBC). The proposed project would implement the recommendations of the geotechnical report and comply with the CBC. Please also refer to **Response to Comment CMTW (2)-2**, below.

Response CMTW (1)-6

The commenter contends that there is evidence of both vertical and horizontal movement along Hayward fault and that the west-dipping Cretaceous strata sub-parallel to the slope above Foothill student housing could cause the slope to fail during a major earthquake on the Hayward fault and destroy all the buildings from the western margin of the LBNL site to Doe Library on the UC Berkeley campus and beyond, a distance of over 1,000 feet west of Gayley Road.

Studies undertaken by PES and UC LBNL (2000), Fugro (2002), and Kleinfelder (2006) on the western slope of LBNL did not find west-dipping on this slope. Rather, these successive studies found these strata generally dip north between 20 and 50 degrees. The mischaracterization of the attitude of these Cretaceous strata aside, the larger concern raised by the comment is regarding the potential failure of this slope and damage to areas of the campus to the west during a strong-to-major earthquake (magnitude 6 to 8) on the Hayward fault. The generally accepted upper limit uplift rate of 1 millimeter per year in the Bay Area indicates this slope has existed for at least tens of thousands of years, during which it has experienced at least tens of Hayward fault earthquakes based on current understanding of this fault. Bedrock failure of this slope during any of these earthquakes would have deposited material derived from the Cretaceous strata at the toe of the slope, which is occupied by the Hayward fault.

Fault and geotechnical investigations for Foothill student housing in this location did not encounter such landslide deposits. Rather, soil containing rhyolite, a volcanic rock, was encountered west of the Hayward fault. No volcanic rock deposits exist between the IGB and the closest trace of the Hayward fault. The volcanic rock at the Foothill housing location was likely translated north by the movement of the block east of the fault from the mouth of Strawberry Creek, which does have volcanic rock in its watershed. In addition, an inactive shear zone located generally along Gayley Road to the west, the "Louderback trace," was overlain by only a few feet of natural soil deposits. The last movement on this shear zone was at least 11,000 years ago, indicating that any landslide deposits in this location are at least that old. Consequently, the geologic record indicates the western slope of LBNL is stable with regard to potential bedrock landslides impinging on areas beyond the toe of the slope posited in the public comments.

The geotechnical investigation report for the IGB (A3GEO 2014) indicates that the IGB site is underlain by Tertiary Orinda Formation rocks that are geologically stable. See **Response to Comment CMTW (1)-1,** above.

Response CMTW (1)-7

Please see **Response to Comment CMTW (1)-6**, above regarding landslides in the area of the IGB project.

Response CMTW (1)-8

Please see **Response to Comment CMTW (1)-1**, regarding the assertion that a caldera filled with unstable materials is present on the LBNL site.

Response CMTW (1)-9

The IGB Environmental Analysis and Checklist and the 2006 LRDP EIR, which is incorporated by reference, provide an adequate description of the existing geologic and hydrologic conditions at the project site. As stated in the IGB Environmental Analysis and Checklist, the proposed IGB project would occupy the site of the former Building 51 (Bevatron), which was removed over a period of years ending in 2012. The site is currently largely paved and serves as a temporary parking lot and storage area. The site is a large, graded, nearly level area, underlain by compacted cohesive soils and bedrock. Pursuant to LRDP Mitigation Measure GEO-2, a geotechnical investigation was completed for the proposed project in September 2014. According to the geotechnical report, the IGB site is relatively free of geologic hazards other than earthquake groundshaking; a hazard shared through the region that is routinely mitigated through the seismic design provisions of the California Building Code. The IGB site is situated on level ground unaffected by previous landsliding and there is little to no potential for ground failure to occur beneath the site (IGB Environmental Analysis and Checklist page 58).

Section 5.9 in the IGB Environmental Analysis and Checklist provides information on the site's existing hydrology. The proposed IGB project site is located within Blackberry Canyon which is within Strawberry Creek watershed. Prior to development, the project site was on the southern flank of Blackberry Canyon with a northwest-trending tributary to Blackberry Creek passing through the site. In the early 1950s, the Bevatron construction on the project site modified the previous topography and resulted in the placement of impervious surfaces on the project site. Most of the project site is currently impervious as it is covered with paved parking areas. Surface water flows from the project site and the larger Strawberry Creek watershed are ultimately

discharged into San Francisco Bay south of the Berkeley Marina at the terminus of the municipal storm drain system that conveys Strawberry Creek through the city of Berkeley. Groundwater flows to the west. (IGB Environmental Analysis and Checklist pages 76, 77, 79, and 80).

Response CMTW (1)-10

Please note that CEQA requires the evaluation of a project's impacts on the environment relative to existing conditions (*State CEQA Guidelines* Sections 15125 (a) and 15126.2 (a)), and not an evaluation of the project's impacts on conditions that might have existed in the project area in the past. As noted in **Response to Comment CMTW(1)-9,** above, although a brief description of previous hydrologic conditions on the project site is included in the checklist document, it is not necessary that the IGB Environmental Analysis and Checklist include a detailed description of past hydrology. In addition, it is beyond the scope of this IGB environmental analysis to describe and analyze the ground and surface water movement throughout the entire Strawberry Creek watershed. Hydrology relevant to the proposed project is described and analyzed in 2006 LRDP EIR Section IV.G Hydrology and Water Quality, and in IGB Environmental Analysis and Checklist Section 5.9 Hydrology and Water Quality.

The commenter's assertion about the North Fork of Strawberry Creek's relationship with the former Bevatron building is noted. The proposed IGB would not include a basement or other subsurface rooms. Please also see **Response to Comment CMTW (1)-18**.

Response CMTW (1)-11

Please see **Response to Comment CMTW(1)-9**, above for information regarding existing geological and hydrological conditions at the project site, and please see **Responses to Comments CMTW(1)-13, 14, 15,** and **19,** below for the commenter's concern about groundwater problems at the project site.

The IGB Environmental Analysis and Checklist and the 2006 LRDP EIR contain descriptions and analyses of the hydrologic and geologic settings of the proposed IGB site, including 2006 LRDP EIR Sections IV.E Geology and Soils and IV.G Hydrology and Water Quality; and the IGB Environmental Analysis and Checklist Sections 5.6 Geology and Soils and 5.9 Hydrology and Water Quality. These sections include identification and mapping of historic slope failure sites as well as areas where such sites have been repaired and addressed.

The particular landslide incident that occurred over 40 years ago north of the IGB site and that is raised by the commenter, is identified and mapped in the 2006 LRDP EIR (IV.E-7), which includes the following: "The landslide beneath Buildings 46 and 46A … (has) been repaired and no longer represent(s) a hazard to the buildings."

The IGB Environmental Analysis and Checklist addresses potential landslide risks and includes the following statement on page 58:

> *Pursuant to LRDP (EIR) Mitigation Measure GEO-2, a geotechnical investigation was completed in September 2014. According to the geotechnical report, the IGB site is relatively free of geologic hazards other than earthquake groundshaking; a hazard shared throughout the region that is routinely mitigated through seismic design provisions of the California Building Code. The IGB site is situated on level ground unaffected by*

> *previous landsliding. Although there is no potential for landslides on the project site, there is a small landslide zone to the southeast of the project site and a larger landslide zone east of the project site. The geotechnical study determined that the small landslide zone would not pose any hazard to the proposed IGB and MUP (A3GEO 2014). Nevertheless, this slide will continue to be studied as the layout of the building is finalized to confirm that slope stabilization is not required; although not anticipated, if slope stabilization is determined to be necessary, the geotechnical recommendations will be incorporated into the building design. The larger landslide to the east of the project site was also evaluated in the geotechnical investigation and determined to not pose a hazard to the proposed IGB.*

While the Environmental Analysis and Checklist does identify some potential landslide-related risk to the proposed Modular Utility Plant (MUP) and planned access driveway to the southeast of the IGB site, there are several options identified in the geotechnical report, including relocation of the MUP and/or landslide stabilization, which would avoid this risk. Either way, the Environmental Analysis and Checklist concludes that this issue would not introduce any impacts to a building on this site beyond those already analyzed in the 2006 LRDP EIR.

Response CMTW (1)-12

The "Shively well" mentioned by the commenter is a feature that is maintained and operated by UC Berkeley; it is not on the LBNL site and is far removed from the proposed IGB site. For information about the general operations of the Shively well, the commenter should contact UC Berkeley.

Response CMTW (1)-13

The existing contamination within the footprint of the IGB project and nearby areas is described in Sections 2.5 and 5.8 of the IGB Environmental Analysis and Checklist. As the analysis shows, the project can be built on the approximately 1-acre project site without resulting in an excessive human health risk to project site occupants from the remaining contamination within the IGB footprint.

With respect to existing contamination within the larger Bevatron site, LBNL is continuing to implement a remediation program in compliance with DTSC requirements for remediation of the site, regardless of whether IGB is constructed. Please see **Response to Comment CMTW (1)-19** for more information about contamination levels at the proposed project site.

Please see pages 5 and 6 in the IGB Environmental Analysis and Checklist for reasons why the JGI program needs to be relocated to the LBNL site. Please also note that the environmental analysis of the proposed IGB project has shown that the project would not expose the building occupants to an unacceptable human health risk (pages 44 and 45) or other safety risks such as from landslides and excessive ground shaking (pages 58 and 59).

Response CMTW (1)-14

Existing soil and groundwater contamination at the LBNL site is identified, mapped, and analyzed in the 2006 LRDP EIR, including the ongoing work to remediate such historical legacy contamination (2006 LRDP EIR pages IV.F-5 et seq). No impacts related to groundwater contamination or its remediation are found to be significant or in excess of impacts reported in

the 2006 LRDP EIR. Since the publication of the IGB Environmental Analysis and Checklist, the California Department of Toxic Substances Control (DTSC) approved the risk assessment results indicating that site-specific conditions and planned IGB characteristics are protective of future indoor workers based on a less than one-in-a-million excess cancer risk and a Hazard Index (HI) of less than 1.0. Ongoing efforts to remediate on site contamination will continue as planned – with or without the IGB project – and in coordination with the DTSC.

Response CMTW (1)-15

Please see **Response to Comment CMTW (1)-13** and **CMTW (1)-19** regarding groundwater contamination on the Bevatron site and the process underway to remediate it and control off-site migration.

The proposed IGB project would not interfere with the remediation activities or in any way affect movement of groundwater (contaminated or otherwise). The analysis presented in the IGB Environmental Analysis and Checklist and the 2006 LRDP EIR is adequate and an EIR is not required.

The groundwater plumes in the IGB area are not migrating. Although the Bevatron Demolition Project scope included removing all of the subgrade concrete walls and floors of the Air Duct shafts, the easternmost sections were left in place to help limit potential post-demolition migration of contaminated groundwater. Also a subdrain was installed at the level of the former Bevatron basement to capture potentially contaminated groundwater. Since a rise in the water table was expected, an observation casing was placed in the backfill to monitor changes in the groundwater level. The water level in the backfill rose several feet within the former Air Duct area and therefore LBNL implemented a DTSC approved Interim Corrective Measure (ICM) to lower the water table and help ensure that contaminated groundwater did not migrate into the clean backfill. The ICM has been effective in controlling the migration. Migration of the contaminated groundwater to the west of the IGB site has also been controlled by the DTSC approved corrective measures that were implemented in the former Building 51L area. There is no off-site migration of VOCs in groundwater from the Bevatron area or the IGB area specifically.

Response CMTW (1)-16

As stated in **Response to Comment CMTW (1)-15,** above, the proposed IGB project would not interfere with any groundwater and soil contamination or ongoing remediation activities. Furthermore, with the incorporation of standard project features, the proposed IGB project would not result in potentially significant environmental impacts and the US Department of Energy (DOE) has determined that the proposed project qualifies for a categorical exclusion under the National Environmental Policy Act (NEPA). The DOE has determined that preparation of an environmental assessment (EA) or an EIS is not required.

Response CMTW (1)-17

The hydrogeologic conditions at the IGB site have been fully characterized as part of the geotechnical investigation of the site as well as in conjunction with the investigation of on-site contamination and remediation activities. The results of these evaluations are summarized, as appropriate, in the IGB Environmental Analysis and Checklist.

With respect to the assertion that a collapsed caldera is present on the LBNL site, please see **Response to Comment CMTW (1)-1,** above.

For issues related to landslides as affecting the IGB project, please see **Response to Comment CMTW(1)-11**, above, and for concerns related to the effects of nearby faults and earthquakes on the IGB project, please see **Responses to Comments CMTW(1)-5** and **CMTW(1)-6**, above.

For migration of contaminated groundwater in the Bevatron area, please see **Response to Comment CMTW(1)-15,** above, and to **Responses to Comments CMTW(1)-19** through **CMTW(1)-24**, below.

Response CMTW (1)-18

The comment is noted. The information provided by the commenter does not appear to have a bearing on the proposed IGB, which would not include a basement or subsurface level (as did the former Bevatron). Even so, the University does not agree with the commenter's assertion that the former Bevatron's "basement was always full of water" and that it "had to be constantly pumped." Likewise, the University does not endorse as currently verified the "Interpretation of Historic Channel Network at LBNL" map provided by the commenter; this map appears to rely on information dating as far back as 1875 and 1935, and that has not been corroborated or more recently verified by qualified experts.

Response CMTW (1)-19

Please see **Response to Comment CMTW (1)-18**, above. The information that was used to make planning decisions during the Bevatron Demolition project was based on contemporaneous studies and investigations. For more information about the Bevatron project, please see the "Demolition of the Building 51 and the Bevatron" Final EIR (July 2007; State Clearinghouse #2005032095).

Monitoring for subsurface contamination on the proposed IGB site has been taking place as follows: currently there are 16 wells used to monitor groundwater under the former Building 51 footprint, an additional 9 wells in the parking lot area immediately downgradient from the footprint, and 6 wells in the unpaved area of the former Building 51 Vacuum Pump Room immediately east of the parking lot.

Concentrations of VOCs in the groundwater in the former Vacuum Pump area have decreased since the Interim Corrective Measures (ICM) Concentrations of VOCs in the groundwater in the Building 51A area have also been decreasing or are remaining relatively stable. Concentration trend graphs are provided in UC LBNL's February semiannual reports available online or at the Berkeley Public library.

Response CMTW (1)-20

Please see **Response to Comment CMTW (1)-18**, above. The IGB project is based on current and ongoing state–of-the-art geotechnical exploration, studies, and planning. Excavation would be minimal, and there would be no subsurface or basement levels. Accordingly, there would be little or no interaction between the proposed IGB building and the movement of subsurface groundwater. For more information about the IGB project plans and the geotechnical basis for those plans, please refer to the IGB Environmental Analysis and Checklist and the accompanying

Geotechnical Investigation Report (A3GEO 2014). All are available on the UC LBNL's IGB website: http://www.lbl.gov/community/integrative-genomics-building

Response CMTW (1)-21

Please see **Responses to Comments CMTW (1)-20** and **CMTW (1)-19**, above. UC LBNL acknowledges the commenter's point that certain types of faults may be able to act as barriers and/or conduits affecting groundwater flow. However, in the case of the proposed project site, any fault features that might exist in the vicinity of the site would lie deep underground and within the bedrock formation, which is well below the level at which groundwater flows through the site.

UC LBNL also notes that the maps provided by the commenter contain a conglomeration of apparent faults and other geologic features as identified by a wide variety of sources over a period extending back into the 19th century. Many of the faults and features identified in these maps have not been verified by independent geologists and technical specialists who have been retained by the University to investigate current conditions. The plans and analyses used by UC LBNL for the IGB and other projects on the LBNL site rely on current and verified sources.

Response CMTW (1)-22

Please see **Responses to Comments CMTW (1)-21** and **CMTW (1)-14**, above.

Response CMTW (1)-23

The commenter's request that a new Environmental Impact Report (EIR) pursuant to CEQA be prepared for the IGB project is noted. The CEQA documentation process is articulated in Section 2.1 of the IGB Environmental Analysis and Checklist.

The University stated in the LBNL 2006 LRDP EIR (page III-48) that in addition to disclosing the environmental impacts from the adoption of the 2006 LRDP, the Program EIR would also be used by the Lab and/or by the Regents in connection with the consideration of specific projects pursuant to the 2006 LRDP, and possibly for the later modifications of such projects. The 2006 LRDP EIR stated that pursuant to *State CEQA Guidelines* Section 15168, some projects might be approved as within the scope of the Program EIR.

The IGB Environmental Analysis and Checklist has been prepared pursuant to Section 15168 (c) (2) to demonstrate that the proposed project is within the scope of the 2006 LRDP EIR. Consistent with *State CEQA Guidelines* Section 15168(c)(4), a checklist utilizing the *State CEQA Guidelines* Appendix G list of questions was used to document the evaluation of the site- and project-specific information to determine whether the environmental impacts of the proposed project were covered in the Program EIR. The IGB Environmental Analysis and Checklist systematically examined the impact analysis in the 2006 LRDP EIR, the current conditions on and adjacent to the project site, the attributes and features of the proposed IGB project, and analyzed the likely environmental effects of the IGB project for all 17 resource topics on the CEQA checklist, including Geology and Soils (pages 56 to 61), Hazards and Hazardous Materials (pages 69 to 75), and Hydrology and Water Quality (pages 76 to 81). For each resource topic, it also examined whether any new information has become available since the certification of the 2006 LRDP EIR and found that even though some new information has become available, the information does not present new or substantially more severe impacts as compared to the environmental analysis

previously conducted for the 2006 LRDP EIR. The environmental review of the IGB project fully complies with CEQA and its implementing guidelines.

The IGB Environmental Analysis and Checklist on page 3 reads:

> *UC LBNL has determined— on the basis of the analysis and this environmental checklist – that the environmental impacts from construction of a building on the project site were evaluated in the Program EIR, and that under* State CEQA Guidelines *Section 15162 there would be no new impacts and no new mitigation measures are required. Therefore further evaluation and documentation under CEQA are not required. (*State CEQA Guidelines *Section 15168(c)(2))*

The groundwater table at the project site is subject to several feet of rising and falling seasonally as a function of seasonal rain levels, stormwater flow, soil saturation, and related factors. Please also refer to **Response to Comment CMTW (1)-15**, above.

Response CMTW (1)-24

UC LBNL through its remediation efforts and testing and monitoring programs has shown that subsurface volatile organic compound (VOC) levels in the vicinity of the project site have been decreasing since implementation of the Interim Corrective Measures program and not rising as posited by the commenter. Please also see **Response to Comment CMTW (1)-19**, above.

Groundwater contamination at the site originated with operation of the Bevatron, which began around 1940. The University is working with the DTSC to appropriately remediate the site, regardless of whether IGB is constructed.

Response CMTW (1)-25

The commenter's contention that two "huge structures (are planned) to be built on the Bevatron complex demolition site (see Attachment 9)" appears to be based on a literal reading (and thus a misinterpretation) of the 2006 LRDP EIR "Illustrative Development Scenario." (The "Attachment 9" figure included by the commenter is a diagram based on the 2006 LRDP Illustrative Development Scenario).

As described on 2006 LRDP EIR page III-36, the Illustrative Development Scenario (IDS) is

> *a conceptual portrayal of potential development under the LRDP … (and) is intended to provide a conservative basis for the analysis of environmental impacts… the Illustrative Development Scenario is not intended to be a precise representation of the actual development program that would take place over the 20-year planning horizon of the 2006 LRDP.*

The large building posited in the IDS on the Bevatron site (apparently confused by the commenter to be two buildings) is identified as building S-3. This hypothetical 200,000-gross-square-foot (gsf) lab-office building with a projected 435-person occupancy would not be constructed, and the much smaller (77,000 gsf, 333-person occupancy) lab-office IGB would be constructed in the general area of its IDS footprint.

It is the 2006 LRDP EIR analysis of Building S-3 that in part provides the conservative basis for demonstrating CEQA 15168(c)(2) coverage of the IGB project.

Response CMTW (1)-26

The suggestion to daylight the North Fork of Strawberry Creek on the IGB project site and preserve the project site as open space is noted. This suggestion – along with all of the other comments received on the IGB Environmental Analysis and Checklist – will be provided to the UC Board of Regents for consideration when the IGB project is submitted to for Regental approval.

Committee to Minimize Toxic Waste

URGENT

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March 30, 2015

ADDENDUM

To CMTW's Comment Letter, Dated March 23, 2015,
on the Draft Environmental Analysis and Checklist
for the Integrative Genomics Building (IGB) proposed
to be located at the Lawrence Berkeley National Laboratory

Dear Mr. Philliber,

On Thursday, March 19, 2015 I called you and requested a hard copy of the IGB project EA document. You referred me to a Mr. Weston Lile at LBNL's PR department. He answered the phone:"Lawrence Livermore Laboratory", when I called him. He had the hard copies you had given him and said he will mail one to me the very same day (3/19) or at the latest the following day. I waited until the day the comments were due, March 24th., but no document arrived. Finally, on Thursday, 3/26, 2 days after the comment period had ended, I received the packet from Weston, with a postmark of 3/25 i.e. it was mailed a day after the comment period had ended!

So, I am submitting this ADDENDUM to CMTW's comment letter to be considered as part of our comments of 3/23/2015, as well as expressing concern that LBNL's PR department is not acting in the public's interest, although we, the tax payers are paying the staff's salaries! (Attachment 1).

The IGB EA, dated February 2015, was based on the assumption that the LBNL 2006 LRDP EIR had adequately addressed all potentially significant effects associated with this new project. This is not true. The EA is totally deficient and lacks any serious analysis related to the potential impacts presented by the site itself, such as Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality etc, all areas where new information has surfaced during the past decade since the 2006 LRDP was prepared.

1

1/10

There were no maps, no descriptions of the potential impacts created by the presence of the active Hayward Fault Zone within the project site. (Attachment 2) How may meters to the Alquist Priolo Earthquake Fault Zone? There was no reference to the Cyclotron Fault which crosses the Bevatron site. No reference to the New Fault, University Fault, Lawrence Hall of Science Fault Complex, all impacting the IGB project site. (Attachment 3.) 2

There were no maps, no in-depth descriptions related to the presence of chemical and radioactive contamination in the soil, in the groundwater at the site. What are the impacts of evaporating VOCs on human occupants of the IGB or other buildings in the area? And the environment? During a time → when the contaminated groundwater suddenly rises? 3

There were no maps, no descriptions related to the presence of historic streams, fed by at least 3 known springs in the area, mapped in 1875 by Frank Soule. (Attachment 4.) Have the springs been analyzed for VOCs or other contaminants? They are clearly part of the VOC and diesel plumes named after buildings 52, 25A, 7 etc. 4

Provide a map showing the springs, location of original waterways, the current status of contaminants in the area, location of all the fault lines and a description of how the faults act as conduits for contaminated groundwater at the Bevatron site and surrounding area. Include all faults from studies done by Harding-Lawson, Radbruch, Converse Consultants, Lennert & Associates and others. 5

Provide also a map showing all the historic and current landslides at the site and its surroundings, by Kropp Associates, California Geological Survey (2003) and others. It appears that the Bevatron site is in the middle of a slide area that starts below the Lawrence Hall of Science and continues through Building 46 into and passed the proposed IGB site. (Attachments 5 and 6). Are the old hydraugers blocked? What are the mitigations to prevent future landslides in the area, such as the ones in 1974 and in 2012? 6

Due to the critical nature of all the issues listed above, it is imperative that comprehensive analysis of Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality etc. be immediately conducted in a full blown EIR under CEQA and EIS under NEPA, since the IGB will be owned by the Department of Energy. 7

In addition, it is important that formal public hearings be arranged, so that the general public will learn more about the LBNL site, this proposed project and the reasons why the original plan to locate the IGB at the UC's Richmond Field Station site was scrapped and why the fragile, dangerous Strawberry Creek Watershed site continues to be loaded up with yet another mega-structure. 8

2/10

New information related to this project site has been published since the 2006 LBNL LRDP EIR was prepared. These documents include CMTW's 2007 Report : Contaminant Plumes of LBNL and their interrelation to Faults, Landslides, and Streams in Strawberry Canyon, also critical infomation provided by geologist Garniss Curtis in 2008 (letter to the UCOP) and the 2009 DVD produced for Save Strawberry Canyon, titled: THE FAULT, Quakes, Slides and the Lawrence Berkeley Lab, all of which must be taken into consideration in an EIR/EIS. 9

The 2006 LRDP ignored evidence of the caldera, upon which the entire LBNL campus was built, ⟶ it also ignored the huge slides of 1974, caused by a breeching of the caldera. The DVD features geologist Curtis as well engineer John Shively, who was instrumental in averting potentially disastrous effects of the 2 simultaneous landslides of 1974. We ask that the comments provided by Garniss Curtis and John Shively in the DVD be responded to as part of the comments process for this project. (Attachment 7.) 10

Sincerely,

Pamela Sihvola
CMTW
P.O. Box 9646
Berkeley, California 94709

3/10

ATTACHMENT 1.

Lawrence Berkeley National Laboratory
c/o Weston Lile
One Cyclotron Road
50A-4119H
Berkeley, CA 94720

neopost
03/25/2015
US POSTAGE $005.95
PRIORITY MAIL
ZIP 94720
041L11251410

First Class Mail

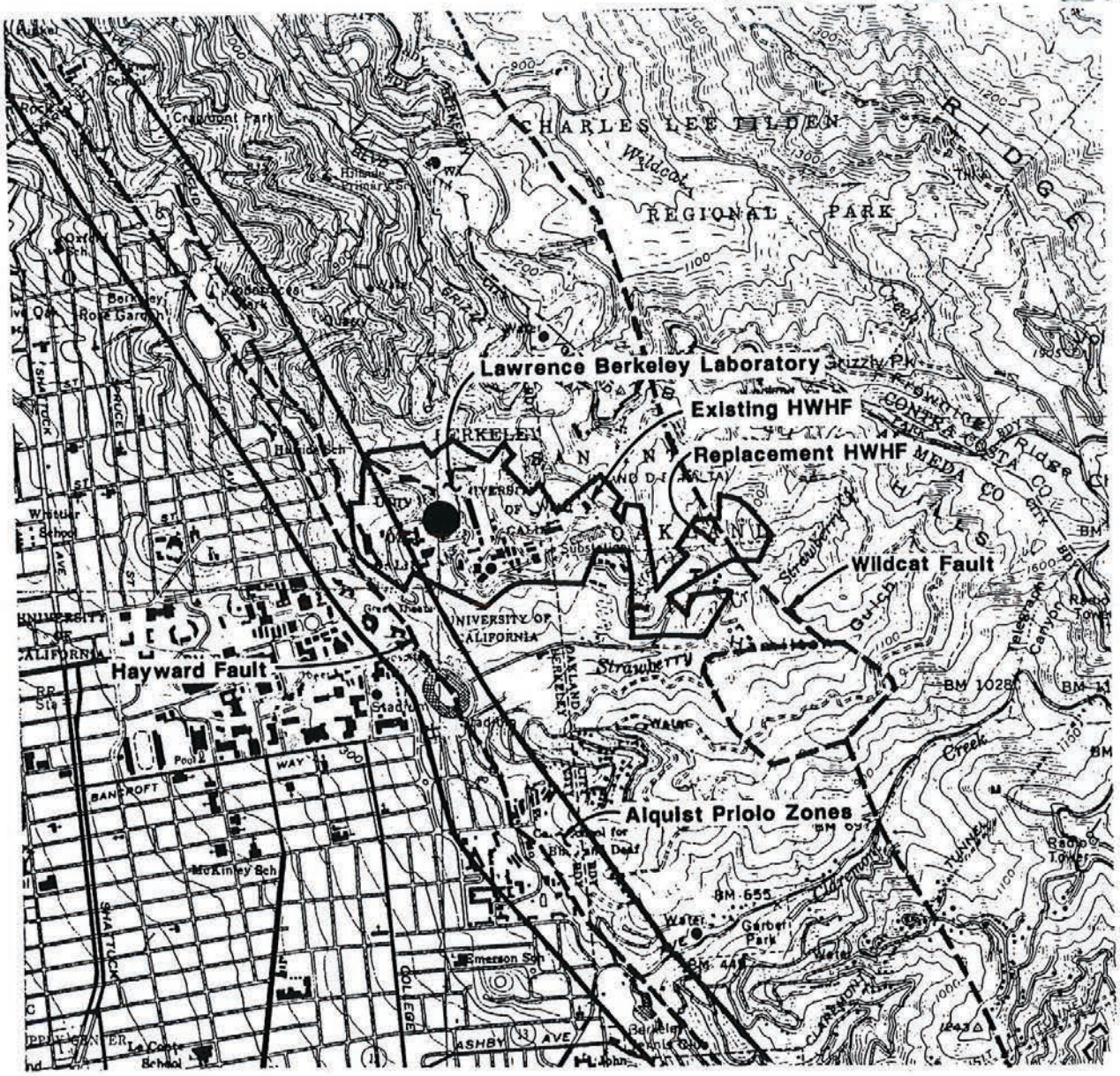
REQUESTED
ON THURSDAY 3/19·2015
POSTMARKED WED 3/25·2015
R'ED THURS 3/26·2015 → 2 DAYS AFTER COMMENT PERIOD ENDED !!

FOR COMMENTS
DUE TUESDAY
3/24·2015

Ms. Pamela Sihvola
P.O. Box 9646
Berkeley, CA 94709

4/10

ATTACHMENT 2.



SOURCE: Base Map U.S.G.S.
California Division of Mines and Geology 1992

● = BEVATRON (IGB) SITE

NORTH

0 1000 2000

SCALE IN FEET

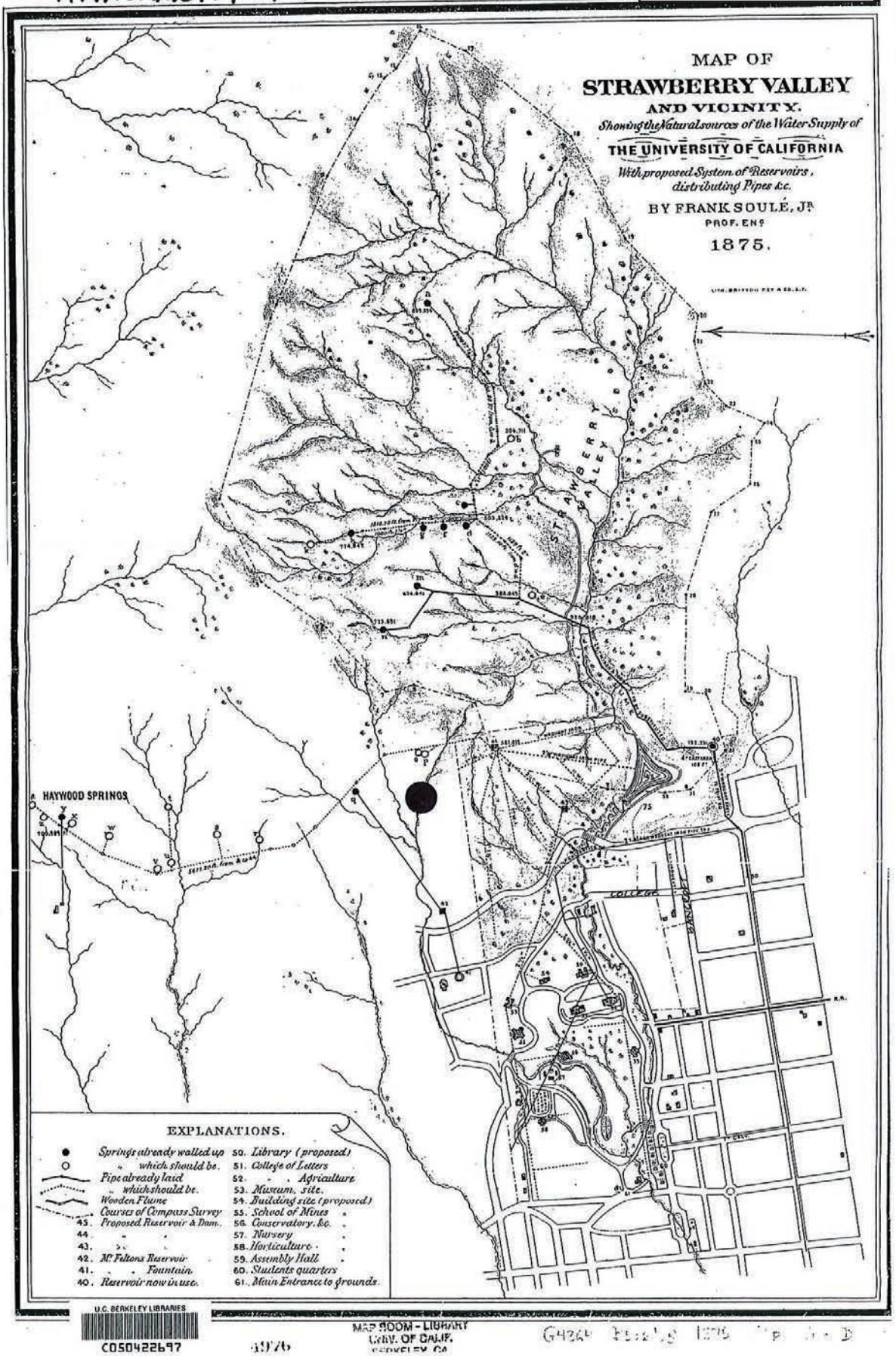
FIGURE II-20
MAP SHOWING ALQUIST PRIOLO ZONES AND WILDCAT FAULT

Lawrence Berkeley Laboratory II-25

5/10

SFO33214.AO 7.13.92E

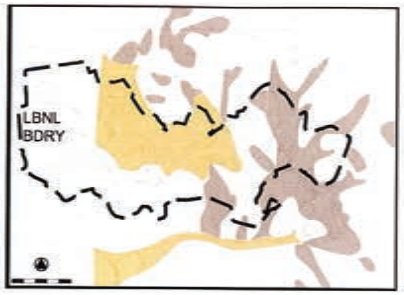
ATTACHMENT 4.



● = BEVATRON (IGB) SITE

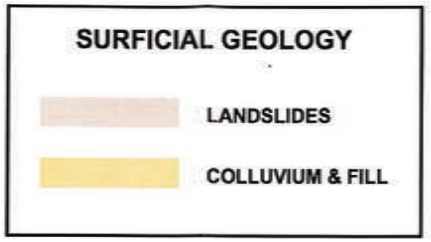
7/10

ATTACHMENT 5.



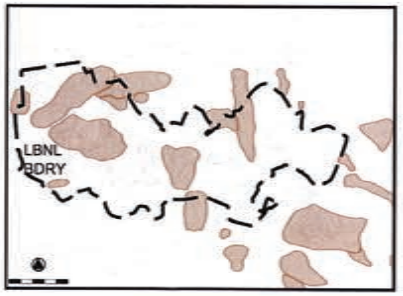
13a. Tor Nielsen, 1975 (USGS)

13b. LBNL, 2000



13c. Unpublished, Received from Kropp Assoc. (no author or date).

13d. Unpublished, Received from Kropp Assoc. (no author or date).



13e. California Geological Survey, 2003

FIGURES 13a-13e. MAPS OF LANDSLIDE STUDIES AND SURFICIAL DEPOSITS GEOLOGY

8/10

CMTW(2)

ATTACHMENT 6.

9/10

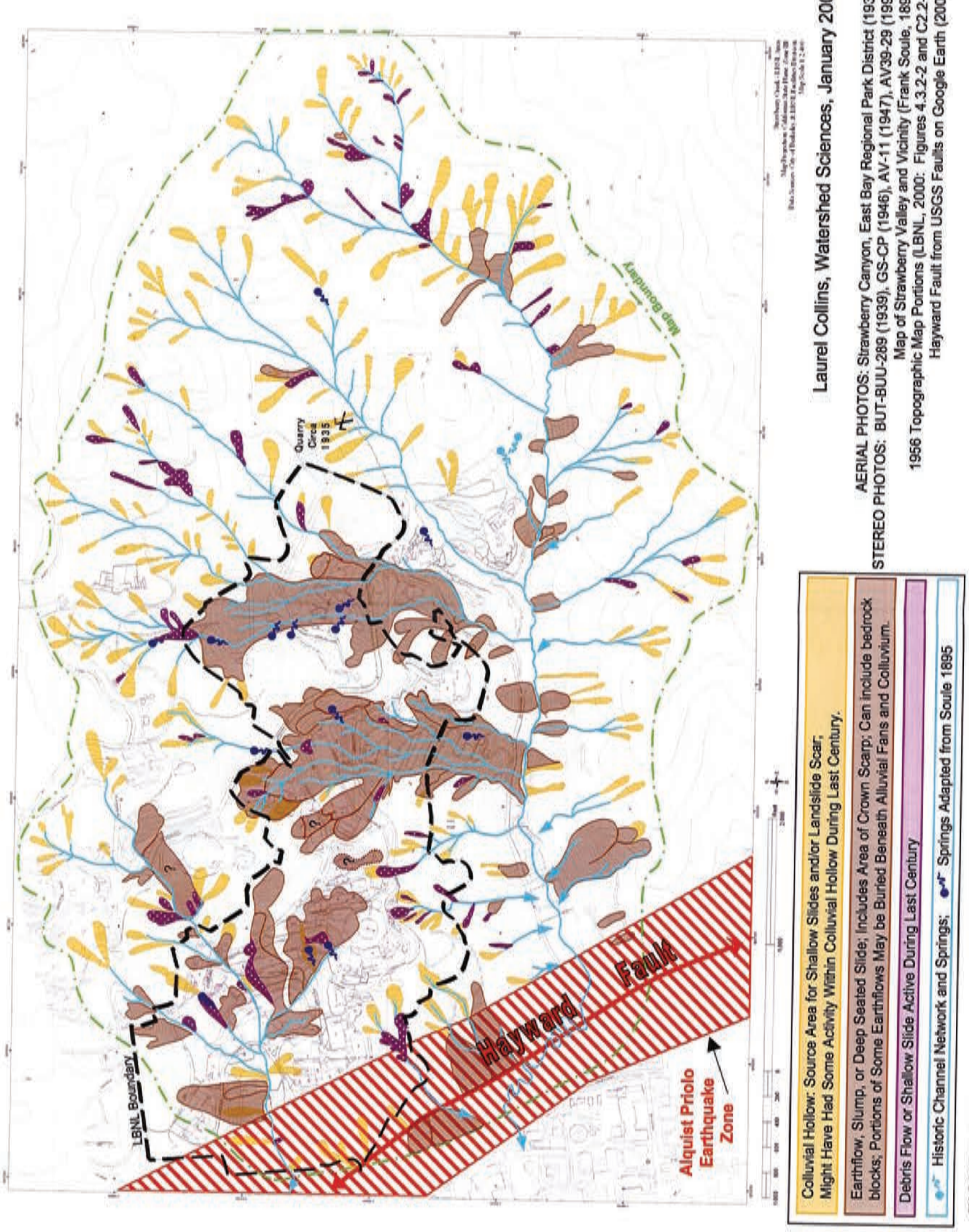


FIGURE 13f. INTERPRETATION OF HISTORIC CHANNEL AND LANDSLIDE NETWORK AT LBNL IN STRAWBERRY CANYON

CMTW(2)

ATTACHMENT 7.

THE FAULT

Quakes, Slides, & the Lawrence Berkeley Lab

THE FAULT Quakes, Slides, & the Lawrence Berkeley Lab

SELECTIVE MEMORY

In its Long-Range Development Plan (2006) and individual EIRs, the Lawrence Berkeley National Laboratory ignores the landslides of 1974 and disregards the unstable, loosely-compacted volcanic fill under its campus that made the slides so dangerous. While the Lab concedes that a major earthquake will damage its buildings, it brushes aside concerns that earthquakes in slide-prone terrain can be a deadly combination.

The major earthquake forecast for the northern Hayward Fault any time within the next 30 years will not only impact Lab buildings but could trigger fresh slides of massive quantities of earth. Further development of this vulnerable hillside site is fraught with risk.

THE FAULT features expert commentary from...

Engineer John Shively, who was instrumental in averting potentially disastrous effects of the two simultaneous 1974 landslides on the Lab campus. Caused by a rupture in one of many cavities within the collapsed volcano underlying a vast area above the UC campus, the slides damaged roads, utilities, and a building on the Lab land. Shively chose the most effective location for the pump that stopped the sliding.

Geologist Garniss Curtis. Tracing the outlines of the caldera, Professor Curtis explains how this unstable bowl of mud, rock and water endangers the Lab, campus, and neighborhood.

Sponsored by **Save Strawberry Canyon**
DVD 16 minutes Copyright 2009 Georgia Wright
Produced by East Bay Media Center

DVD

10/10

Committee to Minimize Toxic Waste, Pam Sihvola, dated March 30, 2015

Response CMTW (2)-1

UC LBNL stated in the LBNL 2006 LRDP EIR (page III-48) that in addition to disclosing the environmental impacts from the adoption of the 2006 LRDP, the Program EIR would also be used by the Lab and/or by the Regents in connection with the consideration of specific projects pursuant to the 2006 LRDP, and possibly for the later modifications of such projects. The 2006 LRDP EIR stated that pursuant to *State CEQA Guidelines* Section 15168, some projects might be approved as within the scope of the Program EIR.

The IGB Environmental Analysis and Checklist has been prepared pursuant to Section 15168 (c)(2) to demonstrate that the proposed project is within the scope of the 2006 LRDP EIR. Consistent with *State CEQA Guidelines* Section 15168(c)(4), a checklist was devised following the approach provided in *State CEQA Guidelines* Appendix G. This checklist format was then used to help the University determine and document whether the environmental impacts of the proposed project were covered in the Program EIR.

The IGB Environmental Analysis and Checklist demonstrates systematic examination of the impact analysis in the 2006 LRDP EIR, the current conditions on and adjacent to the project site, and the attributes and features of the proposed IGB project. The Environmental Analysis and Checklist covers the potential environmental effects of the IGB project for all 17 resource topics on the CEQA checklist, including Geology and Soils (pages 56 to 61), Hazards and Hazardous Materials (pages 69 to 75) and Hydrology and Water Quality (pages 76 to 81). For each resource topic, it documents whether any new information has become available since the certification of the 2006 LRDP EIR. Based on this documentation, the Environmental Analysis and Checklist demonstrates that the IGB project and new information that has become available since the 2006 LRDP EIR do not alter the conclusions of the environmental analysis previously conducted in the 2006 LRDP EIR. The environmental review of the IGB project fully complies with CEQA and its implementing guidelines.

Response CMTW (2)-2

All of the major faults in the vicinity of the LBNL site are discussed on page 56 of the IGB Environmental Analysis and Checklist. As stated on page 58, earthquake fault rupture is not a significant concern as the IGB site is at least 1,000 feet away from the closest known or suspected active fault trace of the Hayward fault. The northwest-trending Cyclotron Fault referred to be the commenter is the geologic contact between Tertiary Orinda Formation rocks (on the northeast) and Cretaceous Great Valley Complex rocks (on the southwest). Section 4.05.2 of the geotechnical investigation report for the IGB (A3GEO 2014) specifically refers to this fault contact and states that it is not considered active. The New Fault, University Fault and Lawrence Hall of Science Fault referred to by the commenter appear on a 1984 compilation map (Converse Consultants, 1984) with the note "could not be confirmed." Subsequent geologic studies have found no evidence supporting the existence of the New Fault, University Fault and Lawrence Hall of Science Fault, which are now generally dismissed as speculative. Please also refer to **Response to Comment CMTW (1)-5**, above.

Response CMTW (2)-3

The existing contamination on the project site is described on pages 10, 11, 70, and 71 in the IGB Environmental Analysis and Checklist. Figure 3.0-4, VOCs Detected in Soil Vapor, shows the levels of soil vapor contamination on and adjacent to the project site based on the 2014 sampling. UC LBNL concluded that the detected VOCs pose no unacceptable risks to current site workers (construction workers or maintenance staff working outdoors) due to incomplete exposure pathways. However adverse health effects could result from potential exposures to VOCs that might infiltrate into indoor air (i.e., vapor intrusion). To address this concern, a human health risk assessment was prepared that evaluated two exposure pathways: a vertical (upward through the floor slab) and a lateral (through a building wall in contact with soil) vapor intrusion exposure pathway. The results of that analysis, which are reported in the IGB Environmental Analysis and Checklist, show that the soil vapor present in the area would not result in an excessive human health risk to building occupants. The circular subdrain under the Bevatron was replaced after demolition of the Bevatron. Although no significant rise in the water level under the IGB is expected, any significant rise would be controlled by the replacement subdrain and the drain lines under the retaining walls to the east (please also refer to **Responses to Comments CMTW (1)-15** and **CMTW(1)-23),** above).

Response CMTW (2)-4

The commenter requests specific descriptions and information about springs outside of the project site and as identified in a historic document dating back to 1875. The 2006 LRDP EIR, the IGB Environmental Analysis and Checklist, the IGB geotechnical analysis, and other supporting studies provide up to date information relevant to the proposed project. The IGB document presents existing conditions at and near the IGB site; at the present time; there are no known springs on the project site or in the immediately surrounding area. CEQA requires a project to be evaluated relative to existing conditions. Site conditions (for example, related to springs) as reported in the 19th Century have not been verified and are not considered to be as reliable as current information gathered using modern knowledge, techniques, and equipment. Moreover, site conditions (including topography, hydrology, permeability, landscape, etc.) have changed substantially over the past 130 years. Please also refer to **Response to Comment CMTW (1)-21,** above.

For monitoring of VOC concentrations in groundwater, please see **Responses to Comments CMTW (1)-13** and **CMTW (1)-19,** above.

Response CMTW (2)-5

Please see **Response to Comment CMTW (1)-10**, et seq. The IGB Environmental Analysis and Checklist and the 2006 LRDP EIR contain descriptions and analyses of the hydrologic, geologic, and subsurface contamination settings of the proposed IGB site, including 2006 LRDP EIR Sections IV.E Geology and Soils, IV.F Hazards and Hazardous Materials, and IV.G Hydrology and Water Quality; and the IGB Environmental Analysis and Checklist Sections 5.6 Geology and Soils, 5.8 Hazards and Hazardous Materials, and 5.9 Hydrology and Water Quality. These sections include identification and mapping of groundwater contamination plumes.

CEQA requires a project to be evaluated relative to existing conditions. At the present time, there are no known springs or drainages on the IGB site or in the immediate vicinity. Therefore a map showing springs or drainages that were in the area historically is not necessary for the analysis

(Please also refer to **Response to Comment CMTW (2)-4**, above). The IGB document incorporates by reference the information in the 2006 LRDP EIR, and that document includes fault zone and seismic hazard zone maps (Figures IV.E-2 and IV.E-4). The IGB Environmental Analysis and Checklist includes a site-specific diagram showing where VOCs have been detected in soil vapor based on sampling conducted in 2014 (Figure 3.0-4). The 2006 LRDP EIR includes a map showing all known groundwater contamination plumes at the LBNL site (Figure IV.F-1). Mapping, data, and analysis of an extensive soil-boring regimen on the site are available in the supporting Geotechnical Investigation Report (A3GEO 2014). Regarding faults acting as conduits for contaminated groundwater, please see **Response to Comment CMTW (1)-21**.

The information that is included in the 2006 LRDP EIR, the IGB Environmental Analysis and Checklist, and associated supporting studies is appropriate and sufficient to demonstrate that the environmental impacts from construction of a building on the project site were evaluated in the 2006 LRDP EIR, and that under *State CEQA Guidelines* Section 15162 there would be no new impacts and no new mitigation measures are required. Further evaluation and documentation under CEQA are not required as per *State CEQA Guidelines* Section 15168(c)(2).

Response CMTW (2)-6

For issues related to landslides as affecting the IGB project, please see **Response to Comment CMTW (1)-11**. Maps of current, historic, and repaired slides are provided in the 2006 LRDP EIR. In addition, the geotechnical study prepared for the proposed IGB project provides a detailed history of landslides at the LBNL site, along with geotechnical interpretation, analysis, and recommendations for the proposed project.

The information that is included in the 2006 LRDP EIR, the IGB Environmental Analysis and Checklist, and associated supporting studies is appropriate and sufficient to demonstrate that the environmental impacts from construction of a building on the project site were evaluated in the 2006 LRDP EIR. In addition this information shows that under *State CEQA Guidelines* Section 15162, there would be no new impacts and no new mitigation measures are required. Further evaluation and documentation under CEQA are not required as per *State CEQA Guidelines* Section 15168(c)(2).

Response CMTW (2)-7

Please see **Response to Comment CMTW (2)-1** as to why an EIR is not required for the proposed project and **Response to Comment CMTW (1)-16** as to why an EIS is not required.

Response CMTW (2)-8

The commenter's request for a public hearing on the IGB project is noted.

UC LBNL has presented plans and information about the proposed IGB at several public meetings. For example, at meetings of the UC LBNL Community Advisory Group (CAG) in May 2014, July 2014, January 2015, and March 2015. At the March 9, 2015 CAG meeting in downtown Berkeley, UC LBNL made detailed presentations of the IGB project, construction process, design, and environmental process. The UC LBNL CAG meets routinely, typically once every two months, and encourages public attendance and public participation.

In October 2013, UC LBNL publicly presented at a Richmond City Council meeting on the change in federal funding for the proposed biosciences project at the Richmond Field Station.

In regard to the commenter's concern about construction of a "mega-structure" on the proposed project site, please see **Response to Comment CMTW (1)-25**. Responses to various concerns about the potential for project effects on the local watershed are provided in multiple responses to the **CMTW (1)** and **CMTW (2)** comment letters.

Response CMTW (2)-9

Please see **Responses to Comments CMTW (2)-2** to **CMTW(2)-6** regarding on-site contamination, landslides, faults, and groundwater. With respect to geologist Garniss Curtis's letter cited in this comment, see **Response to Comment CMTW (1)-1**. See also **Response to Comment CMTW (2)-10**, below, in regards to the 2009 DVD entitled "The Fault." As all of these responses and other responses to comments in **Letters CMTW (1)** and **CMTW (2)** show, the information presented by CMTW is either dated, not supported by facts and verified studies, or simply not applicable to the IGB project. As a result, none of the conclusions regarding the impacts of the IGB project, as presented in the IGB Environmental Analysis and Checklist, would change as a result of this information presented by CMTW. The project is within the scope of the 2006 LRDP EIR analysis and as explained in **Response to Comment CMTW (2)-1**, an EIR is not required.

Response CMTW (2)-10

The commenter's provision of a 2009 DVD entitled "The Fault" is noted. It has been reviewed by UC LBNL and determined to provide no new information relevant to the adequacy of the proposed IGB project CEQA analyses. Please see **Responses to Comments CMTW (1)-17**, and **CMTW (2)-9**, above.

Jim Jones **<kakagi@sonic.net>** 12:06 PM (22 hours ago)

to Planning

Dear Jeff,

As an uphill, upwind neighbor on Campus Drive directly on the edge of your property, we have lived through years of demolition and reconstruction over the past 30 years.. We have been subjected to 7 days a week of loud trucks, loud people and loud generators as well as loud whistle blowing. Usually there is a 4:30 am truck delivery of materials and or a garbage pickup with the usual ear piercing back up sounds as trucks navigate your construction zones. This past Christmas the lab left a high pitched humming generator on for 7 days non-stop during the shut down at Christmas break. We have learned over the years that our concerns are worthless and our sleep deprivation is irrelevant. If only the administration lived so close by their workplace, they might reconsider how you move forward. Your former director lived up on Ajax Place, not quite close enough to be subjected to the continual disruptions the lab produces. So obviously, I don't really think that ALL environmental concerns have been addressed over the years. I look forward to hearing from you.

1

Sincerely,
Jim and Dana Jones
1554 Campus Drive

Jim and Dana Jones, dated March 10, 2015

Response Jones-1

The comments regarding noise from previous construction activities, garbage trucks, and existing generators are noted. These are observations about existing conditions and are not related to the proposed IGB project.

IGB project construction would occur at least 0.20 mile from the nearest residence and would not exceed the City of Berkeley's noise standard for construction noise. Noise from mechanical equipment, such as from Heating, Ventilation, and Air Conditioning (HVAC) systems, would be controlled by shielding. Further noise analysis is provided in Section 5.12 Noise, of the IGB Environmental Analysis and Checklist.

Integrative Genomics Building
Environmental Analysis & Checklist

March 10, 2015

Comments on EIR:

1. Transportation Element:

a). Traffic analysis at the 4 intersections studied are irrelevant.

The accumulative effect with this project and other UC Berkeley projects needs to be part of the analysis to get a real life understanding of the problems facing the community. 1

The additional traffic generated by the IGB project will be significant in South East Berkeley. With the additional traffic added to the area by the new Maxwell Field parking lot, other UCB projects and this project, the following streets and intersections (already well below standards) are further impacted and degraded.

1. The Warren-Derby street corridor (a single lane city street system that is the main exit to the south from the Lab and the University).
2. Intersection at Claremont Ave. and Ashby Ave.
3. Intersection at Ashby Ave. and Domingo
4. Tunnel Road (Highway 13) to Highway 24 entrance - both ways.
   This corridor is unsafe for all user and particularly the residents who live East and West of Tunnel Road. Access it extremely dangerous for those entering the roadway.
5. Ashby Ave. from College Ave. to Claremont Ave.

2

Will any mitigations be available for the above problems created by this project?

The occupancy of the new building is shown as 330 persons.

1. How many are hourly employees who will arrive and leave on regular schedules vs. those who can come and go at their leisure?
2. How was this factored into the traffic study and impacts on intersections and streets in Berkeley?
3. Now does the Traffic Manage Plan resolve this issue?

3

b). Construction truck traffic and the effects on street surfaces and the environment: 4

1. What are the provisions for replacing the damage caused by heavy truck traffic on the city streets?
2. How will the air quality be measured and what steps will be taken to eliminate the diesel pollution caused by the constructions trucks? 5
3. Will the community be alerted when contaminated materials are being hauled from the construction site? 6
4. How will auto pollution from commuting employees be mitigated? The communities Climate Action Plan calls for reducing personal car use. What will be done to accomplish this goal? 7

Water Issues:

1. While the drinkable water usage may be considered resolved because the new employees who will occupy the new building will be transferred from the facilities in Walnut Creek and Emeryville. The fact is that those facilities will become occupied by someone else - thus no reduction in water use will be realized.

2. What is the plan (if any) to attempt to realize no gain in water usage from this project?

8

Dean Metzger

Dean Metzger, dated March 10, 2015

Response Metzger-1

The IGB Environmental Analysis and Checklist evaluated the impacts of the proposed project at four intersections because these four intersections are most likely to be impacted by the project based on the City of Berkeley's significance criteria used to identify potential impacts. The City of Berkeley's guidelines for traffic impact analysis require analysis of intersections where a project would increase intersection traffic by 25 or more peak hour trips. As shown on Figure 7 in the Transportation Impact Analysis report (See Appendix C of the Environmental Analysis and Checklist), the project would increase traffic volumes by more than 25 peak hour trips at only one intersection, Hearst Avenue/Gayley Road/La Loma Avenue. Since the proposed project would add fewer than 25 peak hour trips to the other three study intersections, the analysis is conservative and an analysis of additional intersections in the City is not required.

The analysis summarized in the IGB Environmental Analysis and Checklist and provided in more detail in the Transportation Impact Analysis report (Appendix C) includes evaluation of project impacts under near-term (2019) and cumulative (2035) conditions. These analyses account for traffic generated by other proposed and planned developments at LBNL, UC Berkeley, City of Berkeley, and the larger region.

Response Metzger-2

As shown on Figure 7 in the Transportation Impact Analysis report (See Appendix C of the IGB Environmental Analysis and Checklist), the proposed project is estimated to increase project traffic on streets listed in the comment by 12 peak hour trips or fewer. This number is below the criterion of 25 peak hour trips that is used by the City of Berkeley to include and exclude study intersections for impact assessment. The reasoning is that if fewer than 25 peak hour trips are added to an intersection or a roadway by a project, the impact of this traffic would be less than significant because the small number of peak hour trips would be within the typical fluctuations in daily traffic volumes and would not be noticeable to most motorists. Because of the small number of trips that would be added by the project to the city intersections and roadways mentioned in the comment, the proposed project would result in less than significant impacts on these facilities.

The Environmental Analysis and Checklist includes, as standard project features, mitigation measures included in the 2006 LRDP EIR; no additional mitigation measures are necessary because the project would not cause any additional significant impacts on transportation. However, consistent with the 2006 LRDP planning principles and in compliance with LRDP EIR Mitigation Measure TRANS -1e, which requires UC LBNL to implement a transportation demand management (TDM) program, the proposed project has been designed to reduce vehicle trips. The IGB building would be in close proximity to a shuttle stop and employees would be encouraged to participate in the LBNL employee ride share program. The project would also supply bicycle racks and shower facilities and reduce the amount of parking spaces on the LBNL hill site by approximately 60 spaces. Please also refer to **Response to Comment Metzger-3**, below.

Response Metzger-3

As shown in Table 10 in Environmental Analysis and Checklist Section 5.16, Transportation and Traffic, the transportation impact analysis assumes that the proposed IGB occupants would be similar to other LBNL employees, and therefore would have similar trip-making patterns, including arrival and departure times. This assumption is appropriate as the JGI and Kbase employees are and would continue to have schedules similar to the rest of the LBNL staff.

As the analysis shows, the traffic added by the proposed project would not result in any significant impacts on city streets and intersections.

A Transportation Demand Management (TDM) Plan has been implemented as a mitigation measure in the 2006 LRDP EIR (LRDP MM Trans-1). The TDM Plan is currently undergoing review as UC LBNL looks for ways to further reduce its staff needs for parking and single-occupancy commuting. Among the measures implemented or maintained under the TDM Plan are free, continuous (through the workday) round-trip shuttles around the Lab site and to BART and other downtown Berkeley locations; "Zimride" ridesharing program; carpool matching and special carpool parking; bike racks on buses, bike facilities at buildings, showers for staff, and other forms of bicycle support; EV chargers for staff-owned electric vehicles; on-site lodging for guests and visitors; on-site cafeteria for staff; a Guaranteed Ride Home program, etc.

Response Metzger-4

As described in Environmental Analysis and Checklist Section 5.16 Transportation and Traffic, the construction-related truck traffic generated by the proposed project is not expected to result in substantial wear of roadway pavements. This affirms the 2006 LRDP EIR analysis conclusions in regard to pavement impact. Therefore, the proposed project would not be expected to result in a potentially significant impact.

Response Metzger-5

Construction and operational criteria air pollutant emissions were estimated and analyzed in Environmental Analysis and Checklist Section 5.3 Air Quality. The daily emissions of criteria air pollutants from projected construction activities were found to be less than thresholds established by the Bay Area Air Quality Management District (BAAQMD). The IGB Environmental Analysis and Checklist (page 46) also reports the results of a human health risk assessment that was prepared to evaluate the human health effects from project diesel emissions. This analysis conservatively takes into account diesel emissions generated by the maximum number of daily construction truck trips expected to travel to and from the LBNL site. That analysis shows that human health effects from diesel emissions would be less than significant. Therefore air quality does not need to be monitored during project construction for diesel or other air emissions.

Response Metzger-6

IGB would not require demolition of existing buildings and excavation would be minimal. Therefore, it is expected that very little material would be off-hauled from the site. If any materials containing contaminants were off-hauled from the LBNL facility, they would be transported to an approved landfill in containers and vehicles as per all applicable federal, state, and local requirements, including Department of Energy and UC LBNL procedures. Notification

to the City of Berkeley would follow all established protocols between UC LBNL and the City of Berkeley.

Response Metzger-7

The City of Berkeley's Climate Action Plan is not applicable to this project. Berkeley Lab operates under federal requirements for greenhouse gas (GHG) reduction, and will prepare its own Climate Action Plan. LBNL reports its Site Sustainability Plan to DOE annually (https://drive.google.com/file/d/0BzVhhrDxKcoabklpdjlUazFaSm8/view?pli=1). However, as described on page 11 of Appendix A, UC LBNL has implemented a Transportation Demand Management (TDM) plan that aims to reduce single-occupant automobile trips. In addition, as stated on page 21 of the Transportation Impact Analysis (IGB Environmental Analysis and Checklist Appendix C), the proposed project would reduce the available parking supply at LBNL, which would further encourage use of public transit. As noted above, the location of the IGB is accessible by shuttle and the new building would include bicycle racks and shower facilities. Considering that parking at LBNL is at or near capacity on most weekdays, it is likely that the proposed project and other future developments at LBNL would result in lower automobile trip generation rates than current observations at the site. The relocation of multiple employees from another work location also creates the opportunity for vanpools. Please see **Response to Comment Metzger-2**, above.

Response Metzger-8

It is not known whether the previously occupied facilities in Walnut Creek and Emeryville would be re-occupied, nor in what capacity those privately owned facilities would be used. Therefore, it would be speculative to assume the new occupants of the vacated facilities would use as much water as the JGI or KBase programs.

While it is not reasonable to assume that a zero-increase in water usage at LBNL can be achieved with this project, the JGI and KBase programs would use less water at the IGB site than at their current leased sites. This would be due to modern, Leadership in Energy & Environmental Design (LEED) Gold standard building design that includes high-efficiency heating and cooling systems and high-efficiency fixtures and low-flow toilet fixtures, as discussed in Section 5.17 Utilities and Services Systems. The landscaping proposed as part of the project would be primarily comprised of drought-tolerant, low water-use, and low fire-fuel plant materials. Lawn areas are not proposed as part of the project.

Shivley

From: **Jamen Shively** <jamenshively@gmail.com>
Date: Tue, Mar 24, 2015 at 9:37 PM
Subject: Integrative Genomics Building Proposed Location
To: Planning@lbl.gov
Cc: John Shively <jrshively@gmail.com>

Attention to Jeff Philliber, Chief Environmental Planner

To whom it may concern regarding the proposed location of the Genomics Building:

I worked with Professor Garniss Curtis, Emeritus Professor of Geology, U.C. Berkeley, who passed away in about 2011.

In the approximately 2-year period prior to his passing, Prof. Curtis strongly advised about the risks associated with building new buildings up in and around the LBL area in the Berkeley hills, due to the proximity to the Hayward Fault, which in Dr. Curtis' opinion, is now due to activate again.

1

Thank you for considering this important information.

Sincerely,

John R. Shively, P.E.

P.O. Box 7136

Berkeley, CA 94707

(helped by son Jamen Shively)

John Shively, dated March 24, 2015

Response Shivley-1

The comment is noted. For concerns raised by Professor Curtis regarding development risks on the LBNL site and issues associated with the Hayward fault, please see **Responses to Comments CMTW (1)-1,** and **CMTW (1)-4** through **CMTW (1)-6**.

Stage

March 9, 2015

Integrative Genomics Building
Environmental Analysis & Checklist

COMMENT CARD

(Please complete all lines below.)

Comments: Seems as if the VOCs will need to be cleaned up completely eventually. Why not clean up the whole Bevatron site all at one time – ?

1

Name Elizabeth Stage

Address

Phone No. Email Stage@berkeley.edu

Elizabeth Stage, dated March 9, 2015

Response Stage-1

UC LBNL is currently working with the California Department of Toxic Substances Control (DTSC) to remediate all of the contamination plumes in the vicinity of the proposed IGB site. This will occur whether or not the IGB project moves forward. Remediation efforts require a concerted focus of resources and efforts; it is therefore most feasible to conduct remediation in discrete and manageable allotments based on priorities set by UC LBNL and the Department of Energy.

Swift

March 9, 2015

Integrative Genomics Building
Environmental Analysis & Checklist

COMMENT CARD

(Please complete all lines below.)

Comments: A suggestion to use more green infrastructure to filter water – particularly stormwater – to slow run-off for flood mitigation and aesthetics. Also consider stormwater catchment basins for water use as irrigation or fire suppression.

1

Name Diz Swift

Address 1580 Olympus Ave Berkeley, CA 94708

Phone No. 510-548-4808 Email dizmorcswift@att.net

Send email comments to: **planning@lbl.gov**

Diz Swift, dated March 9, 2015

Response Swift-1

Storm water is analyzed under Section 5.9 Hydrology & Water Quality, in the IGB Environmental Analysis and Checklist. As discussed, the IGB project would generally maintain the amount of impervious surfaces on the project site. There actually may be a small reduction in impervious surfaces on the site. If hydrologic analyses show that storm water retention is necessary, rainfall would be captured and reused for irrigation or detained and released downstream in a manner that mimics the predevelopment hydrology. This would avoid hydromodification and flooding in the receiving waters downstream of the project site. On-site storm water infiltration would be strictly limited due to environmental considerations regarding on-site contamination.

3.0 ERRATA

3.1 INTRODUCTION

This chapter shows revisions to the Environmental Analysis and Checklist, subsequent to the document's publication and public review. These revisions have been made to correct typographic errors in the Environmental Analysis and Checklist as published in February 2015. The revised text is excerpted from the Environmental Analysis and Checklist and shown below. Strikethrough (~~strikethrough~~) text indicates a deletion and underlined (<u>underlined</u>) text indicates an addition.

3.2 REVISIONS TO THE ENVIRONMENTAL ANALYSIS AND CHECKLIST

The second paragraph on page 25 of the Environmental Analysis and Checklist has been revised as follows:

> The 2006 LRDP EIR also noted that any use of the EIR in connection with subsequent approval is subject to two additional restrictions that resulted from consultations with the City of Berkeley. First, the EIR will not be used as the first-tier EIR for any project exceeding a net total of ~~890,000~~<u>980,000</u> gsf of new occupiable space construction or 320,000 gsf of demolition. Second, a new traffic study will be prepared at the earliest to occur of 10 years after the LRDP EIR is certified or the date on which development at the Lab pursuant to the 2006 LRDP reaches 375 net new parking spaces. Neither of these two restrictions applies because the proposed project will add only 77,000 square feet of new occupiable space, and a new traffic study is not needed because 10 years have not lapsed since EIR certification and the number of net new parking spaces at the Lab has not reached 375 spaces.

The text under Item "d" in Section 5.17, Utility and Service Systems, on page 124 of the Environmental Analysis and Checklist has been revised as follows:

> JGI and KBase are two existing programs that would move from their current locations in Walnut Creek and Emeryville to the IGB building. JGI and KBase collectively use about 8.72 mgy of water which is supplied by EBMUD and the Contra Costa Water District. Because of water efficiency included in the proposed IGB project, the two programs consolidated on the LBNL hill site would use substantially less water than under existing conditions. The proposed project would install water conservation devices such as low-flow plumbing fixtures and water-saving appliances; other devices and new technology ~~(e.g., drip irrigation, re-circulating cooling systems, etc.)~~ would be employed where practicable to further water conservation. Additionally, landscaping introduced to the project site would include drought-tolerant plant materials. The proposed IGB building and population associated with the proposed project would therefore use about ~~3.95~~ <u>3.095</u> mgy, and there would be a net decrease in water demand during operation of the IGB project. Therefore, the proposed project would not result in the need for new or expanded water entitlements. The proposed project's impact is adequately addressed under LRDP Impact ~~UTILS-2~~<u>UTILS-1</u> and would be less than significant.

The last paragraph on page 117 of the Environmental Analysis and Checklist has been revised as follows:

Through the 2006 LRDP EIR and the LBNL 2006 LRDP EIR Supplement approvals process , UC LBNL is committed to working with the City of Berkeley and UC Berkeley to implement **LRDP EIR Mitigation Measure TRANS-8** which requires implementation of the measures ~~at~~pertaining to the four intersections, ~~identified in~~specifically **LRDP EIR Mitigation Measures TRANS-1a** ~~through~~, **TRANS-1b**, and **TRANS-1e**. This includes conducting a detailed study at the Hearst Avenue/Gayley Road–La Loma Avenue intersection and contributing on a fair-share basis to the cost of implementing any specific mitigation measures identified through the study. The study was completed in November 2009 and identified a number of improvements that, taken together, would be sufficient to improve year 2025 LOS from F to E. UC LBNL has committed to its share of the necessary funding, but as of the preparation of this document, no improvement plan has been adopted by the City of Berkeley. Cumulative impacts on LOS at the Hearst Avenue/Gayley Road–La Loma Avenue intersection were therefore identified as significant and unavoidable in both the 2006 LRDP EIR and in the 2010 supplemental analysis. A similar condition pertains for the other three intersections identified in the 2006 LRDP EIR and supplemental analysis as significantly affected—improvements have been identified and UC LBNL has committed to fair-share funding, but since improvement plans have yet to be adopted by the City, cumulative impacts at the Durant Avenue/Piedmont Avenue, Gayley Road/Stadium Rim Way, and Bancroft Way/Piedmont Avenue intersections are considered significant and unavoidable.

The text in the first full paragraph on page 119 of the Environmental Analysis and Checklist has been revised as follows:

In summary, the IGB project's long-term operational traffic contribution to the four affected intersections would be comparatively small, but is nonetheless conservatively evaluated as cumulatively considerable. It would be effectively mitigated through implementation of **LRDP EIR Mitigation Measures ~~TRANS-8~~1a ~~through~~ TRANS-1e**, which is~~are~~ included in the proposed project as a standard project feature~~s~~. However, although it has committed to appropriate, fair-share mitigation for the four affected intersections, UC LBNL alone cannot implement the improvements prescribed in the~~se~~ mitigation measure~~s~~. This mitigation requires participation and fair-share funding from UC Berkeley and the City of Berkeley as well. Until such time that those other entities were to commit to the mitigation-prescribed improvements and participate with UC LBNL in advancing an implementation plan, this CEQA analysis assumes that the IGB project's contribution to this impact would be cumulatively considerable. This impact is adequately analyzed in the LBNL 2006 LRDP EIR Supplement and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the Supplementation of the LBNL 2006 LRDP EIR with respect to Traffic Impacts at One Intersection.

4.0 REFERENCES

A3GEO, Inc. 2014. *Geotechnical Investigation Report Integrative Genomics Building (IGB) Project Conceptual Design Phase*. September 30.

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Fugro West, Inc., *Geotechnical Investigation, Proposed Building 50X, Lawrence Berkeley National Laboratory*, August 5, 2002.

Kleinfelder, Inc. 2006. *Fault Investigation, Computation Research and Theory Building, Lawrence Berkeley National Laboratory, Berkeley, California*, 44. Consulting report prepared for Lawrence Berkeley National Laboratory.

5.0 REPORT PREPARATION

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